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The Clinical Examination of the Nervous System*

By

JAS. McCUNN, M.R.C.V.S., M.R.C.S., L.R.C.P.

Professor of Anatomy, Royal Veterinary College, London

All the tissues and actions of the body are controlled by the nervous system. It also functions as a signalling system indicating when the course is set fair, or when there is danger ahead.

Under normal circumstances this control is so delicately integrated that all parts of the body work in harmony: so delicately, indeed, that even small faults will completely upset this harmony. Any deviation from the normal in the structure or function of the nervous system will give rise to abnormalities in action and in function of the parts under its control. Also, *vice versa,* when these parts become abnormal in structure or function effects are registered upon the nervous system and give rise to signals which can be recognised. This is particularly noticeable when abnormalities occur in the circulatory and endocrine systems.

The animal body can be compared to a factory in which there are many diverse machines under electrical control. Such a factory has a master switchboard at the centre, much conductor wiring, numerous relaying centres, and action stations situated in the individual machines. If the machines work abnormally the maintenance engineers give an eye to the electrical control system. This system may be affected at the individual machine, at a relaying centre, at the master switchboard or even in the wiring. Any interference with the normal flow of current in any of these sites may put individual units out of action, may cause irregular working or it may disrupt the whole. In like manner the nervous system of the body may be affected, and so if we take stock of that system we can gain a knowledge of the site of origin and the cause of the irregular working. The signalling system is so finely tuned that we may receive warning of trouble long before it is made manifest by other means. The inspection of the fundus of the eye is of great help, for this is one part of the nervous system which is exposed to our visual sense. For instance, changes in the kidney register at an early date in the fundus of the eye. As a general rule it may be said that the nearer the fault is to the centre switchboard in the brain the more widespread are the ill-effects.

In order to study the nervous system one must have a reasonable knowledge of its structure and function. This need not be the detailed knowledge of the academic neurologist or anatomist. A fair knowledge of the areas supplied by the motor and sensory nerves is required and also of the origins of these. Much of the information we may gain depends upon our understanding of reflex action, for it is by testing the sensory and motor reflexes that we form the basis for our investigations.

It will be advisable if we plot the plan of the motor and sensory tracts which comprise the various reflex loops.

Motor fibres originate in cells in the cerebral cortex. These cells are situated in the area just in front of the Rolandic fissure. The fibres pass *via* the corona radiata, the internal capsule, the crura cerebri and pons varolii to the medulla oblongata. In the medulla the greatest number cross to the opposite side in the decussation of the pyramids or motor tracts, and then pass down the spinal cord in the lateral columns to end at various levels in the ventral horn of grey matter. Then the impulses they transmit are picked up by motor cells and relayed *via* the ventral spinal nerve roots to a spinal nerve and so to their ultimate destination in muscles. Other motor fibres which do not cross in the medulla are carried in the ventral column of the spinal cord. Eventually these fibres cross *via* the ventral white commissure to end in the ventral horn of grey matter of the opposite side.

Owing to these decussations, impulses which originate in the cerebral cortex exert their effects on the opposite side of the body. There are some fibres which do not cross. They end also in a ventral horn but the latter is on their own side. They have to do with actions such as are performed by the thorax in respiration. These actions are bilateral and symmetrical. This has a most fortunate consequence, for a unilateral lesion sited in the cerebrum can never cause complete paralysis of the chest. A nerve cell and its processes is called a neuron. It will be seen that an impulse which originates in the cerebrum and is destined to a muscle of a limb has to be carried by two neurons, being relayed from one to the other in the ventral horn.

We speak of these two neurons as being upper and lower motor neurons. The upper one (U.M.N.) excites the lower (L.M.N.), but it also exercises a controlling influence. If, therefore, an upper neuron be damaged this control is relaxed or abolished and in consequence the tone of the muscle supplied by the L.M.N. becomes exaggerated or accentuated and the muscle will become rigid or spastic. The tendon reflexes are likewise exaggerated. The muscles do not waste, but the paralysis affects the action of groups of muscles. On the other hand, if the L.M.N. is damaged the muscle will no longer receive stimuli even from an intact U.M.N. The muscles will lose their tone, they may become flaccid and show signs of degeneration and atrophy. Tendon reflexes are lost. L.M.N.s are concerned with the nutrition of muscles and interference with this leads to atrophy. You will see that from an examination of the musculature and the tendon reflexes considerable knowledge can be gained as to the site of a C.N.S. lesion. In brief, U.M.N. lesions lead to increased tone and rigidity, the muscles do not waste and reflexes are exaggerated. The paralysis is usually of a limb or of one side of the body. In L.M.N. lesions the paralysis is a flaccid one, motor reflexes are absent and the paralysis may involve single muscles or groups of muscles, or if both ventral horns are damaged it may progress to paraplegia. Motor impulses are conducted to the periphery *via* efferent nerves. There are other paths which conduct impulses in the reverse direction *via* afferent nerves. These are the sensory impulses. In the first place they are conducted to specific centres of the spinal cord *via* the spinal ganglia and the dorsal nerve roots. This comprises the peripheral or primary sensory neuron. Most of the peripheral sensory neurons terminate in the dorsal horn of grey matter. From here they are relayed by secondary neurons. The tracts of these secondary neurons pass towards the brain and they cross to the opposite side of the cord into the antero-lateral column. Some peripheral fibres do not end in the dorsal horn but pass up the cord in the postero-lateral column of their own side and they terminate in the nuclei of Goll and Burdach in the medulla. From here secondary neuron fibres take impulses to the opposite side of the medulla. In the medulla, therefore, we have sensory fibres conducting impulses on the opposite side of the body from which they originate. After leaving the medulla these fibres are joined by sensory fibres from cranial nerves and pass to the optic thalamus where they terminate. From the optic thalamus a tertiary system conveys these impulses to the cerebral cortex. Only a limited number of afferent impulses register finally as sensations. Others are concerned in spinal reflex action, in the maintenance of muscular tone or in the co-ordination or regulation of muscular activity. *Cranial nerve impulses register on the side from which they originate. These are the general principles on which sensory and motor impulses work.*

It will be seen that a first requisite for the examination of the nervous system is that the investigator should possess a reasonable knowledge of the area supplied by sensory nerves and the muscles or groups of muscles supplied by specific motor nerves. A normal reflex act requires that there shall be no loss of continuity between the afferent sensory and efferent motor fibres of a neuron. If there should be a break in the reflex arc or loop the reflex will be lost. Also the brain exercises a controlling or inhibitory influence on reflex action. Breaks in the reflex loop or arc may be occasioned by accident or disease. It may occur in a L.M.N. due to some abnormal state of the spinal cord such as occurs when the vertebral column is seriously damaged by accident. A knowledge of the areas supplied by particular nerves will enable the examiner to refer the site of injury to a particular segment of the spinal cord or column, or brain or cranium. For example, suppose that there was a complete transverse damage to a section of the spinal cord, what would be the result on the reflexes?

1. Those referred to the damaged portion would be lost.
2. Those referred to areas above the damaged segment would be normal.
3. Those referred to segments below the damage would be exaggerated.

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4. Those referred to the area adjacent to and above the lesion would be hypersensitive and the parts they supplied would be in a state of hyperaesthesia. This would be due to the fact that the damaged tissue would act as an irritant to the adjacent healthy tissue and the afferent sensory fibres issuing therefrom would be stimulated. There might be a band of hyperaesthesia extending round the body.

In veterinary practice we cannot make the complete neurological examination such as can be made in the human patient. We have not our patients' co-operation in speech to help in the elucidation of the finer tactile and location tests. This is the case particularly when dealing with the sensory aspect.

Our efforts are, therefore, somewhat crude and when investigating sensory reflexes we have to rely on crude tactile reaction and sensibility to pain. On the motor side we also miss the patient's voluntary co-operation.

In setting about our examination we can note:—

Motor side

1. Is there weakness or paralysis?
2. Is there inco-ordination of muscular activity?
3. Is the tone of the muscle altered?
4. Is there abnormal muscular movement?
5. Are there signs of atrophy or of trophic nutritional change?
6. Is there alteration in the contour of the part?
7. Are the reflexes normal?

Sensory side

1. Is there abnormality to light, touch or pressure?
2. Is there evidence of pain when pricked?

Before we proceed to these matters it is well to take stock of the *general state of the animal*. Are there any constitutional troubles or defects in parts other than the nervous system *per se*? For instance, there may be some endocrine disturbance. A state of tetany, with its exaggerated reflexes, may be obvious. This may be due to parathyroid gland upset with a resulting diminution of the serum calcium. It may also occur in alkalosis. In the early stages of such a condition the muscles tend to become rigid and motor reflexes exaggerated. In these cases there is one reflex on which I place great value. It is the orbital reflex. If the region of the zygomatic ridge be tapped, the orbital branch of the fifth C.N. can be stimulated. As a result the seventh C.N. comes into action to complete the reflex loop and the eye will blink. If there be a calcium upset this blink will be followed by a series of tremors. I have noted it in dogs, horses and cows. If you try it in your next milk fever case you too will observe it; it may help in the early diagnosis of a case. Further, after the injection of calcium you will note its rapid disappearance.

The effects of some nerve lesions are obvious to the naked eye. I would instance paralysis of the serratus magnus muscle, radial paralysis, obturator paralysis, flexor metatarsi paralysis and paraplegia in the dog.

I have observed paralysis of the serratus magnus quite frequently in the cat and on two occasions in horses. The latter were both show jumpers, so jumping may have some direct bearing on the initiation of the lesion. It may be unilateral or bilateral. In these cases the dorsal border of the scapula rises well above the level of the thoracic spines. It appears to be a painless condition. In the cat a well-marked groove appears between the scapulae into which one can lay a book or one's hand. The gait is a peculiar crouching one. The thorax literally drops down between the fore limbs. The two horses were suspected of having fistulous withers on account of a lump at the withers. I have never known a cat to become normal again but they accommodate to the disability and get about quite well. The two horses recovered after swimming exercises.

The inco-ordination of *ataxia or shivering of the horse* may be observed by the eye alone. Such an abnormality is directly referred to the lumbar cord and is due to an interference with the upper motor neuron's inhibitory or controlling action upon lower motor neurons. Although gross skeletal changes have been blamed it is probable that nutritional factors play a part in producing U.M.N. damage. *Tremor* is another thing evident to the naked eye. It may be fine or coarse. Sometimes it is so light that it is appreciated only when the animal is handled. Sometimes we may see twitching in individual fibres, *i.e.*, fibrillary twitching. It may be in the eyelid muscles, in the triceps or tensor fascia femoris. Often it is due to fatigue. It may be observed in a horse or dog after the severe exertion occasioned in a race. The involuntary movements of *chorea* are in a similar category as regards origin. As a rule the cause can be referred to some cerebral disease or abnormality which interferes with the control exercised through the U.M.N. In this general examination we may note difficulties in swallowing, in defaecation, micturition or in the action of the larynx.

The skin also may show evidence of nerve dysfunction. There may be pigmentary changes, erythema, nodular thickenings, loss of hair or even ulceration. There may be areas almost devoid of sensation and others in a hypersensitive state. You must all be familiar with the "boily" horse in which there is hypersensitiveness of the skin which persists long after the original lesion has resolved. Also with those cases in which, after neurectomy, trophic nutritional disturbance leads to separation at the coronary band and the tendons give way.

Meningitis in one or other of its forms can be recognised almost on sight. It is a condition with which we are all too familiar in these days of unusual complications of distemper. By making an examination we can quite often ascertain if it be of spinal or cranial origin. As a rule it is a complication of some other disease and generally distemper. Quite often it is of a cerebro-spinal type and then the cerebral symptoms are apt to mask the spinal ones. When the disease is secondary to some other process its onset may be insidious. Briefly, the symptoms are as follows. In both cases (cerebral and spinal) the trouble is ushered in by pyrexia. In *the cerebral form* there are exaggerated reflexes, rigidity of limbs, and convulsions. The eyes are very sensitive to light and if the meningitis is basal in position there is optic neuritis, and abnormal action of the third, fourth and sixth nerves. The head is often retracted and drawn to the affected side. Restlessness is pronounced and the meningial cry is almost diagnostic.

In spinal meningitis the sensory reflexes along the spine are very marked. There may be quite acute pain on pressure. The back muscles are rigid. There may be retraction of the head and neck and difficulties in breathing if the trouble is in the cervical region. These signs of sensory irritation give place to paralysis and loss of reflex. As a rule, the sensory pedal reflex is the first to go.

In the cerebral form, when unchecked, the irritability passes to stupor, a dulling of consciousness, and coma. In the case of spinal meningitis which is unchecked one can look for secondary troubles in the urinary system, and the animals live long enough to be troubled with bed sores and ulceration.

Fits and Convulsions.—There is no need to go into details as to the visible signs and symptoms of either the fits of old dogs or the convulsions we see so often in puppies. There is no doubt that in some cases we can find evidence in life of central lesions, such as meningitis, or peripheral centres of irritation such as the presence of ascarides or even preputial or anal troubles. In the great majority of cases, however, there is not such direct causal evidence. We are forced to the conclusion that the symptoms are the result of some cerebral functional derangement.

It may be that somewhere in the body there is being elaborated some toxic or poisonous product which has a selective action upon the brain. Circulatory changes, probably of a venous congestive type, may be at fault, and there is some evidence that nutritional factors are also implicated. All this, even in human animals, is speculative, for the good reason that in most cases a *post-mortem* examination does not reveal a just cause.

Paraplegia in the dog is a worry to all veterinary surgeons. As a rule we are presented with a completely paraplegic animal and a history of sudden onset. Most cases are, however, ushered in with pyrexia. At first the limbs are spastic, *i.e.*, a typical U.M.N. lesion. Later they become flaccid and exhibit signs of L.M.N. lesions. Often there is little to see on *post-mortem* examination although on a few occasions I have seen signs of haemorrhage in the neural canal. In others there appears to be an excess of cerebrospinal fluid. Sensory reflexes are the first to be lost. Whilst any reflex action remains there is reasonable hope of recovery. If there is no improvement in about three weeks, I consider it best to advise that the case is hopeless.

Examination of the Reflexes

Let us now consider our examination of the reflexes. There are quite a number which we can examine in all animals, but the most precise work can be done on the dog and cat. I propose to deal with the matter in a regional manner.

The Head Region.—The face region is provided with sensory fibres by the fifth cranial nerve; the region of the poll and back of the ears by the second and first cervical nerves. Motor power for the face and ears comes from the seventh cranial nerve. The muscles which close the jaw are supplied from the ventral division of fifth cranial nerve. If the seventh cranial nerve be damaged the facial muscles will be paralysed on the affected side. There will be a noticeable alteration in facial expression. The affected muscles are flaccid and the mouth will droop. The lower lid of the eye will fall also. The face is drawn to the unaffected side, food will tend to collect in the affected cheek and there may be dribbling. It is interesting to note that the upper lid may show wrinkling, for the levator palpebrae superioris is under control of the third cranial nerve. If the ventral division of the fifth cranial nerve be affected the lower jaw will drop and a lack or resistance will be noted

when the mouth is opened by hand. There will also be a loss of sensation in the region of the chin. Sometimes this branch of the fifth is affected in the opposite way, the masseter and temporal muscles being in a state of spasm—the condition called "trismus"—and attempts to open the jaw often fail. In milder cases it may be necessary to make use of the reflexes to demonstrate nerve involvement. If the lips, nostrils or whiskers are stimulated by touch a reflex arc *via* the fifth and seventh cranial nerves comes into action. The eyes will blink. If they blink normally then the fifth and seventh are in good order in that region. The zygomatic or orbital reflex previously mentioned as being abnormal in serum-calcium upset is another useful test. The next test is applied to the ears. Tickle the tactile hairs in the external ear or blow into the ear. A normal animal will resent this, twitch the ear and make attempts to draw away. Tickle the back of the ear with your pencil and there will be a similar result. Normal reflexes indicate health of fifth and seventh cranial nerves and the second and first cervical. The loss of reflex may be partial or complete. If complete we can presuppose a central lesion near the nuclei of fifth and seventh, *i.e.*, in the pons or medulla. If only sensation is lost and the animal can still use the muscles of the face and ears, then the fifth N. is at fault. The anterior part of the tongue is supplied by this nerve, so if we apply some distasteful substance to the mucous membrane or scratch it with a pin we gain more knowledge as to No. 5. It is interesting to note that fibrillary twitches in the tongue are often associated with heart or circulatory upset.

A complete seventh paralysis may originate from a lesion in the facial canal in the petrous temporal bone. As the chorda tympani is given off in the canal and also the small nerve to the stapedius muscle there may be two other signs present: in the first instance abnormalities in the secretion of saliva and in the second instance an increased sensitiveness to sharp loud sounds. Whilst we are making these tests we will note if the hearing is at fault; if so, the eighth C.N. is implicated. Nerve deafness in animals is rare and when it does occur it is generally of congenital origin. Whilst examining the head we should pay attention to the eye. Abnormal movements of the eyeball indicate trouble in either third, fourth or sixth C.N's. Dilation of the pupils and loss of reaction to light is also indicative of third C.N. upset. Loss of corneal reflex implicates the orbital and superior maxillary divisions of No. 5. Small, irregular or unequal pupils indicate cerebral or meningeal trouble, and increase in ocular tension with oedematous lesions in the disc or fundus are indicative of an increase in intra-cranial pressure such as occurs in meningitis. Oedema of the discs, retinitis and choroiditis, engorged and tortuous retinal vessels, also draw our attention to renal and heart or circulatory disturbance. On the whole, meningeal troubles are manifested in irritation, exaggerated reflexes, abnormal position of the head and neck, rigidity of limb muscles and a distinctive cry. Encephalic lesions tend to produce stupidness, loss of recognition and intelligence. They are often accompanied by considerable increases in intra-cranial pressure and in such cases vision is affected and the animal is liable to press its head against the wall and stand stupidly immobile. If there should be damage in the motor nerve tracts then paralysis of specific parts results. The degree of effect varies with the site of the lesion. A small lesion in the brain stem, pons or medulla, will evoke a more widespread effect than a lesion of similar size in the cortex or internal capsule.

Whilst dealing with the brain, let us consider the automatic reflex centres in cerebellum and medulla. If they are upset we get twitches, spasms, hyperaesthesia and may be temperature changes with difficulties of balance and of walking in a straight way.

Returning to the face and mouth, difficulty in deglutition draws attention to the ninth C.N. We may apply a test. Open the mouth and tickle the back of the pharynx: if the nerve is normal a contraction of the pharyngeal wall takes place. Loss of this reflex and difficulty in deglutition tends to indicate a central lesion of the ninth C.N. probably in its nucleus in the medulla. Regurgitation *via* the nose draws attention to trouble in the soft palate. Then the vagus, facial and trigeminal nerves have to be reviewed. The soft palate can be tickled. If it lifts the seventh is well, if it tenses the fifth is well, if it contracts the tenth is well. If it contracts normally then its vagal nerve supply is in order. Only one vagus may be affected: then it will draw to the opposite side. The vagus is also responsible for the heart, the respiratory and alimentary systems. If there be roaring or whistling, if the heart is unduly slow, if there be excessive movements of the bowel, think of the vagus.

When opening the mouth, note the movements of the tongue. Can the animal protrude it? Does it resist when pulled upon? If any of these signs are not shown, think of damage to the 12th C.N., the motor nerve of the tongue.

I have not made mention of the olfactory and optic nerves. The tests for their health are obvious, but remember that in the case of the optic nerve one may get a definite optic neuritis when the disc is seen to be swollen and showing various degrees of redness. In such a case, especially if there are signs of a dog being "on end" or jumpy, think of vitamin B and his diet. I have seen dramatic results in such cases follow the administration of whole yeast.

We have spent some time on the head region, but we can also learn much from an examination of other parts of the body. In the larger animal we have to confine our attention to the reflexes provoked by stimulation of the more superficial sensory fibres. Many of these are situated in specific accessible areas of the body and as we know the origin of their parent trunks we are able to relate the reflexes to certain segments of the spinal cord.

In the smaller animal, we can make use of tendon reflexes such as those of the triceps, the extensor carpi radialis, the patella and the tendo-Achillis.

The Neck, Shoulder and Fore-limb.—The skin of the neck is supplied by the cervical nerves, and the most favourable site to test is over the mastoido humeralis muscle, for filaments from the third to sixth cervical nerves issue most conveniently through this muscle at almost regular intervals. Pin prick reaction over the muscle can be referred to approximate segments of the spinal cord. It is well to remember that the second supplies the poll and ear region, so that when the cord is damaged in the region of the atlanto-axial articulation sensory reflexes are very sharp in this area and there may even be acute pain if the occipital crest be tapped. The supra-scapular nerve is distributed to the supra- and infra-spinatus regions; so over this area we can elicit skin reflexes which are related to the sixth and seventh cervical segments. Motor paralysis of this nerve is manifested by loss of power in the spinatus muscles, dropping of the shoulder, catching of the toe and atrophy. When well established this is obvious to the naked eye but an examination of the sensory reflex will help us to spot the case in its early stages.

As we pass down the fore limb we are able to contact cutaneous branches of several nerves. Just below the deltoid tuberosity and running down towards the elbow is a branch from the axillary N. (8 C. 1 T). In front of the elbow joint is a cutaneous branch from the median [7 8 C and 1 T]. On the inner and posterior part of the elbow region is a cutaneous branch from the ulna [1-2 T]. In the forearm the musculo spiral is responsible for the anterior aspect [7, 8 C and 1 T], the median for the inner aspect and the ulna for the posterior and part of the outer aspect. This arrangement extends to the carpus and a little beyond, but below the carpus sensation is shared by the median and ulna. As the median reinforces the ulna when we come to the pastern and foot region, roughly the inner two-thirds is supplied by or from median origin and the outer one-third and part of the heel in the case of the horse by the ulna. If, therefore, we consider the fore limb as a whole and work down the inside to the toe and then up the outer aspect we find that areas are related to the following spinal segments: C 5, 6, at the foot 7, 8, and on the outside T 1, 2, 3. Some of the motor paralyses, such as supra-scapular and radial, are evident to the naked eye. In the small animals we also get evidence of U.M.N. lesions in spasticity, particularly of the extensors, leading to stumbling, exaggerated tendon reflexes, and clonus when the limb in the extended position is pressed upwards from the foot. This often indicates a serum calcium upset.

The Trunk.—The skin right back to the thigh is supplied by the thoracic and lumbar nerves. If we remember that these nerves slope backwards and the last intercostal almost reaches the fold of the flank, and that the lumbar nerves extend to the thigh, we should have little difficulty in relating skin sensory reflexes to their appropriate spinal segments.

Cutaneous nerves from the dorsal division ramify in the region of the longissimus dorsi, and exaggerated skin reflexes in this region often signify a spinal neuritis. Running along with the spur vein is the external thoracic nerve; it can be stimulated as far back as the abdomen and it, like the ulna, is related to the first and second T. segments.

The Hind Limb.—The subcutaneous regions between the crest of the ilium and tuber ischii are supplied by sacral nerves, the stifle region by cutaneous branches from the last intercostal and first two lumbar nerves, from the tuber ischii to the back of the stifle by cutaneous branches from the sciatic [L. 5-6, S. 1]. Below the stifle in the lower thigh, the posterior area is supplied by the internal popliteal which in turn comes from the great sciatic and the anterior part from the cutaneous branch of the peroneal, *i.e.*, from the lesser sciatic, the anterior part of the great sciatic. Below the tarsus, the nerves are derived from the posterior tibial, *i.e.*, from the great sciatic.

On the inner side of the leg we have the internal saphena nerve extending down to the hock. This is referred to 3, 4, 5 L. There are also some separate cutaneous filaments from the lumbar nerves.

From the motor point of view we may map the hind leg into regions. In front of the thigh and down to the patella, anterior crural or femoral, L. 3, 4, 5. Gluteal region. Gluteal nerves, last lumbar and 1 and 2 sacral. Behind the thigh, great sciatic. Inside thigh, *i.e.*, adductor region, obturator, L. 4, 5, 6. In front of the tibia, anterior tibial, L. 3, 4 and 5. Behind the tibia, L. 1, sacral 1 and 2.

The skin of scrotum, prepuce and mammary gland is supplied by L. 1 and 2; the anus region by sacral nerves and the tail by coccygeal and sacral nerves.

The sensory areas of the skin of the hind limb also can be mapped out in a regional manner. There is, of course, some overlapping, but, on the whole, these regions are referred to certain specific segments of the spinal cord:—

1. The anterior and external aspect of the thigh to the lumbo-thoracic region.
2. The posterior aspect of the thigh to posterior lumbar and anterior sacral segments.
3. The lower thigh (external) as in No. 2.
4. The inner aspect of thigh and lower thigh to the lumbo-thoracic region *via* saphena nerve.
5. Hock to post lumbar and sacral area.
6. Below hock also post lumbar and sacral region.

In the smaller animal we can make use of the tendon reflexes, *i.e.*, patella and tendo-Achillis, and we can examine to see if there is muscle clonus. We can learn much by watching the gait and looking for atrophy or twitching and fibrillation. The most common motor lesion which has a specific effect upon gait is observed in obturator paralysis which may be associated with a fracture of the pubis. There is abduction and outward circumduction of the limb in progression.

Sometimes the rectum, anus or tail may be affected. In such cases there is a loss of the anal skin reflex. I have seen a number of such cases in the horse and in my experience the commonest cause has been injury to the loin and croup by a dropping cart shaft. If the tail muscles are paralysed, attention will be drawn to the faecal soiling. When handled the tail will be flaccid or inert. If the paralysis is incomplete the tail may be pulled to one side. Anal power can be tested by inserting a hand or finger. In rectal paralysis no faeces are passed and the tube becomes packed. When emptied it remains dilated and does not grip the arm. I have known horses to be able to defaecate when lying down; probably the explanation is that the pressure on the ground increases the intra-abdominal tension.

From the remarks I have made I think that you will realise the value of the physical examination of the nervous system. We cannot make the elaborate tests of the expert neurologist, but from the few simple exercises which I have mentioned we can gain much valuable information.

One cannot end a paper on the nervous system without touching upon the psychoneuroses. Animals are all built upon a general basic plan, they can all use their brain, they can feel and there is to my mind no doubt that they are capable of thought and of memory. We have no knowledge as to the source, site or the driving force behind such activity. We do know that there is what can be called a normal standard of action or conduct. We also know that some animals do not conform to this standard and consequently act either continuously or intermittently in a manner different from their fellows. Most animals follow what is called "herd instinct," so one can expect the average individual to follow the custom of its mates. But there is the exceptional animal which acts differently. It may be subject to sudden fits of temper, stupidity or even just awkwardness. It is not to be relied upon in any given set of circumstances or changes of environment. I have noticed this particularly in dogs and horses and I have no doubt it can be observed in other animals. I believe that it is associated with some upset of the endocrine system and in dogs I have found thyroid therapy of some service. When confronted with such cases, and when they show no reaction, almost invariably I advise destruction because they may be of grave danger to their owners.

Animal psychology offers a great field to the investigator. The proper understanding of this subject may be the gateway to the human mind.

Discussion

Mr. R. H. Smythe (President), in opening the discussion, said: When Professor McCunn very kindly invited me to open the discussion on the very valuable paper to which you have just listened, I told him that I would confine my remarks to the *clinical* aspects of nervous dysfunction, partially because we, as general practitioners, are chiefly concerned with giving advice as to *treatment* and perhaps, also, because it is a good many years since I studied the nervous system in great detail.

I agree fully with Professor McCunn that it is important that every clinician should retain at least a working knowledge of anatomy and I would add that it is equally important to appreciate the physiological relationship existing between the various tissues and organs of the type of animal which we are called upon to treat.

These beliefs are emphasised to-day when we are considering the function and dysfunction of the varying nerve tissues, which are discussed in Professor McCunn's paper, and we must all be grateful to the essayist for refreshing our memories on points which many of us will have forgotten and for re-awakening our interest in a very important branch of clinical medicine.

Whilst it is desirable that we should be efficient in diagnosis and in prognosis, the necessities of practice demand that we should also be capable of applying our knowledge to the relief of pain and disability, arising from the condition which we diagnose, and I feel very strongly that in this respect there still remains a great deal to be desired.

In human medicine, neurology has developed into a highly specialised subject. During the past 12 months I have experienced the attentions of some of its practitioners and I have been remarkably impressed not only with their capacity for exact, almost mathematical, diagnosis, but also with their intimate knowledge of anatomical and functional relationships. I became acquainted with very numerous nervous reflexes, which were used as an aid in diagnosis, of which I had no previous knowledge.

It is quite entertaining to lie on a couch in one's birthday suit whilst the neurologist maps out the whole surface area of the body in small squares with a blue pencil and then proceeds to insert the point of a needle into all the spots which he considers should be insensitive. There were quite a lot of square inches on my skin surface which must have slipped out of place.

In spite of these little accidents, I was very favourably impressed with the knowledge which these specialists possessed concerning the relationship existing between peripheral and central nervous structures, and it is this aspect of our subject which Professor McCunn has emphasised so ably in his paper to-day. But even in human neurology there does not appear to be an equivalent advance in the treatment of nerve disorders. After the first of the neurologists had charted out my nervous mechanism and located the seat and cause of the trouble, he gave me the impression that his task had been satisfactorily carried out to its definite conclusion and that it only now needed my cheque to make his happiness complete. Naturally, I pressed him for advice as to the appropriate treatment.

After a lot of thought he replied that the *only* treatment was—*rest*—as complete as possible. After a little more thought he asked me to enumerate the various little pleasures which made life bearable, and after I had mentioned all those which appeared commendable, he said simply: "Give them all up!"

Six months later I reappeared for further examination by a second neurologist of equally sound reputation. His examination was identical, his diagnosis corresponded with that of his predecessor, but he too was silent regarding treatment. After a little persuasion, he told me: "Exercise, and lots of it, is the only remedy. Hard work by day and long walks in the evening. Eat well, drink what you like, smoke what you like. In reason, of course!"

After that it became more easy to outline a suitable routine. To please the first practitioner I rest as long as practical economics will permit. To please the second, I enjoy all the pleasures of life which still appear commendable and I am happy to say that the treatment advised by these two specialists has removed any immediate fear of demise.

I have told you all this, not because I think that you are remotely interested in my obscure anatomy or in my personal habits, but merely to emphasise the fact that although experts may agree on the causation of a nervous condition, there may yet be a justifiable difference of opinion as to the best line of treatment. In human medicine this may be of no great consequence. Social conditions provide against illness and idleness, and there are two things to be sanctified, pains and pleasures. Measures which merely give relief from pain are usually quite satisfactory to the human patient and complete recovery can bide its time. I would remind you of the quotation:—

> "For all the happiness mankind can gain
> Is not in pleasure but in rest from pain."

The veterinary practitioner does not give satisfaction quite so easily. The large-animal owner is no sentimentalist. If his horse is suffering from a nerve injury with accompanying loss of function, he wants something done which will shorten the period of idleness

and relieve economic loss. I am not at all sure that we, as practitioners, can give him much practical help apart from advising green fields and sunshine, and these are not always available. There are many other treatments of which we may make use, but I have an unpleasant feeling that the majority are empirical or designed to pass the time required for natural recovery a little less tediously for the owner.

In the case of the smaller animals, kept as pets, economics do not fill the bill so completely, but in the case of canine patients we are confronted daily by the results of virus invasion upon brain cells and we are harassed by the thought that we are pretending to treat a disease tissue in the full knowledge that theoretically, at all events, there is no hope of repair.

Professor McCunn has written his paper with at least one eye on the horse. I propose to deal mainly with the dog and with some few of the many nervous conditions encountered in that animal. I shall consider the title of this paper as including nervous disorders in the widest sense. In the first place, I would like to state that the modern dog enjoys greater nervous instability and a greater accumulation of neuroses than the most hardened human spinster.

The average house dog lives a life of pampered luxury. He has no occasion to seek food—it is brought to him, unfailingly and often. He has no economic worries. He does not need to concern himself with the transfer of metal discs or flimsy pieces of paper from his neighbour's person to his own. He sleeps long hours in a comfortable bed and if a car is not actually provided for him he is taken for delightful country rambles or, failing the countryside, he enjoys a nightly stroll to the most suitable "local." He shares the joys of his human companions and few of their sorrows. And he is bored to death! He is fast degenerating into a hysterical neurotic, a worry to his owner and an even greater worry to his veterinary attendant. Once more: Why? There are many possible causes but probably only one real answer.

Nerve disorders in the dog may be localised or general.

The localised disorders may be traumatic but frequently they are of obscure origin and in many cases the apparent site of the trouble is remote from the nerve lesion which gives rise to it.

General nervous disorders may be hereditary or acquired. Those which are hereditary include inherent nervous irritability with exaggerated reflexes and hysterical tendencies, and in addition one encounters definite neuroses or neurotic tendencies such as Scottie cramp, Dachshund paralysis and Setter blindness.

The acquired nerve disorders include trauma and hyperaesthesia of definite and well-marked skin areas, including that of the lips, feet and tail, any of which may be examples of referred pain, originating in a remote nerve tissue.

But by far the greatest number of acquired nervous disorders in the dog are the direct result of the destructive action of an unknown number of viruses upon brain cells, medulla and spinal cord, together with the membranes surrounding these tissues, causing in many cases irreparable damage.

It is difficult to say to what extent nerve tissue is influenced by the artificial feeding enforced upon the dog. Although regarded as carnivorous, in the wild state he was more nearly omnivorous and in the domesticated state is completely so. His normal diet is partly the liver and lungs of herbivorous animals, but he has a decided partiality for the partially digested stomach contents of the animals he kills. Uncleaned tripe is even to-day a more reliable treatment for hysterical conditions than the most modern therapeutic preparations.

It would be easy to say that the dog cannot live a healthy life on a diet of carbohydrate with a minimum of protein, were it not for the fact that the great majority do live on this diet quite successfully. I believe that the real reason why so many dogs suffer from generalised nervous dysfunction, excluding the results of virus infection, is that the dog is now descended genetically from such a jumble of anatomical freaks that he can no longer synchronise the nervous impulses derived from his mixed ancestors. We can imagine a puppy saying "My grandfather was designed to gallop and jump hedges and hunt by sight—my grandmother was short-sighted and hunted by smell—but my mother preferred to crawl on her belly and to burrow into holes." Perhaps we breed humans on rather similar lines, but the offspring of such matings are removed from the public gaze, whilst dogs enjoy their freedom whatever their mental ratio.

Endowed with this genetical handicap, the dog is then subjected to the strain of domestication. He is isolated from his fellows and exists in an unnatural environment. He is offered human companionship as a substitute, but being normally ruled by instinct, he finds himself ruled by reason, or by what appears to be such to the dog's owner. As a result, his life is one of frustrations, repressions and misunderstanding. In such circumstances he depends for the continuance of his sanity upon his capacity for adaptation, which is a variable factor even in the highest beings.

Viewed from the human standpoint, a minority of dogs would be regarded as mentally deficient. From the canine angle, the ways of humans must be even less understandable. I wonder how many humans forced to live in an environment so unnatural as that occupied by the domestic dog would retain complete nervous stability?

The cat never suffers from hysteria. It remains a normal individual retaining its primitive instincts. It rightly refuses to be subjected to the will of man but is wise enough to accept, with reservations, the comfort which man can provide.

Some Nerve Disorders in Animals

I will now pass on to a brief review of some of the more common nerve disorders in animals in the hope that Professor McCunn will enlarge upon them in his reply.

In the first place, what information can we derive from the examination of a case of paraplegia? We encounter the type in which the flexors of the hind limbs are paralysed whilst the extensors retain their power of contraction. The limbs trail behind the animal. Then we meet the spastic type in which the dorsal muscles are relaxed and the abdominal muscles are tensed. In this case the dog sits on the croup with the limbs stretched out in front of the body. Either condition may result from trauma or, on the other hand, they may appear overnight in an animal which has never left the fireside. Will Professor McCunn discuss the lesions which produce these divergent results?

In Dachshund paralysis we have hereditary influences at work, a proportionate lengthening of the vertebrae and an undue strain on the intervertebral ligaments and cartilaginous discs, which becomes more marked with age. In these cases there is a characteristic sequence of clinical manifestations, commencing with acute nerve pain and inability to empty the bladder, followed by local anaesthesia and inability to retain the urine. What are the factors which account for these symptoms?

Then, again, we meet with the otherwise healthy dog which cannot micturate voluntarily. I have in my care, at present, a happy, healthy six-year-old black Cocker dog, which for nine months has only emptied his bladder with the help of manual pressure. There is no obstruction and no prostatic lesion. What is the cause and what is the remedy? We also frequently encounter male dogs which are unable to retain their urine when once the bladder has partially filled. A proportion of these cases respond to the oral administration of stilboestrol. I should like to know the explanation.

Has Professor McCunn anything to tell us about inco-ordination caused by herniation of intervertebral discs or of changes occurring in the bony vertebrae with closing of foramina and pressure on issuing nerve trunks? Such cases appear to be diagnosed with great frequency in human practice but seem rare in dogs. Why? Calcification of invertebral discs is not so uncommon: particularly, I have found, in black Labradors—chiefly in the cervical region. What are the conditions which predispose to this calcification?

With regard to virus infections, we are confronted daily with chorea and are asked by worried clients to make a prognosis. Provided that the animal exhibits no other cerebral or meningeal symptoms, in giving the usual guarded prognosis, we attempt to estimate the potential patience of the owner. We are taught that regeneration can take place in peripheral fibres but not in those of the central nervous system in which the neurilemma is absent and in which demyelination exposes the nerve axis. Theoretically there is no hope of recovery but, in practice, we know that if the owner can be induced to keep the dog alive for nine or twelve months, the symptoms abate in at least 50 per cent. of cases and even complete normality may result.

At this point I would mention that Professor McCunn has made but slight reference to the autonomic nervous system which provides us with many problems. I am almost afraid to start a discussion on nervous disorders in the horse, such as roaring. I might dare to ask him if he can explain the reason for "head-shaking" in the horse. It used to be a common condition but has now nearly disappeared with the quadruped in question. In my youthful days I possessed a horse which periodically developed fits of head-shaking, during which it became unmanageable. One fine Sunday morning I took the lady I then considered to be my "best girl" for a drive. On a lonely country road the horse spoilt the moment by developing head-shaking and promptly bolted. I tried to display my heroism by climbing along the shaft and effecting an impressive rescue, but, although successful, the effort was not appreciated and it ended by my shooting the horse and finding another girl!

I hope Professor McCunn will tell us a little about conditions which may represent either referred pain or local hyperaesthesia. I am visualising the dog which screams hysterically and madly

paws at the mouth if one touches his whiskers and also the dog which bites the end of the tail and continues to do so until the tail is amputated at its root. In the monkey, tail biting is caused by a vitamin deficiency. I wonder if a similar cause operates in the dog?

I would like to correct a statement that eye-blinking in cows results from calcium deficiency. Is not magnesium deficiency a more usual cause?

I must apologise for the length of my discourse. I realise that I have spoken a lot and said but little.

The paper is now open for general discussion and I hope you will all do justice to such an excellent address from our distinguished visitor.

General Discussion

Dr. Blount: Although poultry as a whole were not valuable, pedigree stock could realise a high cash value. The poultry industry was fortunate in that flocks of birds often revealed group symptoms which would not necessarily be noticed in a single animal. Although *post-mortem* examination would reveal the cause it was not the pedigree breeder's wish that this should take place with his more valuable stock when a clinical examination of the nervous system might reveal the nature of the trouble. He would mention several poultry maladies which were related to the nervous system:

(1) Layer's cramp, which was probably a calcium deficiency, sometimes complicated by actual fractures.

(2) Wryneck (limberneck), sometimes caused by botulism, fowl paralysis or associated with an abscess of the middle ear, not unlike that seen in rats due to L3 organisms. Lifted up by the tail, such rats "circled." Davainiasis was also a suggested cause for limberneck.

(3) Fowl paralysis—particularly neuro-lymphomatosis affecting the legs.

(4) The leg paralysis exhibited by birds suffering from lymphomatous tumours of the kidneys—but it was uncertain whether the paralysis was due to pressure of the enclosed sciatic nerves.

(5) Rickets: not to be confused with curly toe—hypovitaminosis B_2.

Professor McCunn had mentioned iritis and in that form of fowl paralysis origin: there were both pin point and distortion of the pupil.

Mr. D. L. Hughes thanked Professor McCunn for his address and asked if the essayist had any information to offer as to the frequency with which nervous dysfunctions arose due to ossification of vertebral foramina and consequent pressure on the issuing spinal nerves.

He mentioned that Blakemore had found cases of blindness in calves caused by the ossification of foramina in the vicinity of the optic nerve and that this was thought to be an avitaminosis A. [Professor McCunn interjected that avitaminosis C could also be responsible and that the condition was sometimes seen in young dogs.]

Mr. Hughes mentioned a case of an old partially blind dog which had for the past year shown symptoms of recurrent partial paraplegia accompanied by paddling movement in the fore legs: this animal had about two or three attacks per day lasting two to three minutes and during the attacks the blindness seemed to be exaggerated.

Mr L. Auchterlonie also expressed his appreciation of a very useful and informative paper. He agreed that the orbital reflex was a very important diagnostic feature in milk fever, but he had also seen it in lactation tetany. He asked Professor McCunn if he would say a few words on ruptured metatarsi muscles.

Mr. Auchterlonie alluded to otitis, taking the form of head shaking in the horse, and asked for information as to the precise lesions present in congenitally deaf dogs—particularly in white animals: he understood that some mal- (or non-) formation in the organ of Corti was responsible for this condition. Mr. Auchterlonie concluded by asking whether retinitis was a feature of glycosuria in animals.

Mr. Eaton agreed with the essayist and other speakers that the orbital reflex could be seen in both hypo-calcaemia and hypo-magnesaemia.

Mr. Carr mentioned the chiropractors—who subscribed to the view that all disease was of nervous origin. They stated that the mind or intelligence was in two distinct parts: one part which could be trained and developed and the other the innate intelligence, by which the involuntary actions of the body were maintained—and that the maintenance of health was one of those involuntary functions. Those people set about their "cures" or rather their maintenance of normal nervous function by "adjusting" the atlanto-occipital or atlanto-axial joints. Mr. Carr instanced a case of complete paralysis in a young puppy—sudden in onset and with no history of illness—which he took to a chiropractor for an X-ray, and whilst there had its atlanto-axial joint adjusted: the puppy was normal within one week. He asked Professor McCunn if he had any views on these people—personally he thought that their basis or disease was on good foundations, *viz.*, that the nervous system played a big part in all diseases.

Mr. Sutton said that in his district they had occasional cases of blindness in calves which they treated more or less empirically with cod-liver oil and usually with good results.

Messrs. Wilkinson and Lake mentioned a case of some years back where a horse was suffering from what appeared to be Ménières disease. The horse was destroyed and Mr. Lake went to great pains to send the fresh head to the Royal Veterinary College for anatomical examination. They enquired whether Professor McCunn remembered the case and could now give them a report on it. The only report they had had, had come many months after the horse was shot and did not leave them any wiser than before—indeed, the only positive point about the report had been that the head was in a state of decomposition. Mr. Lake pointed out that there had indeed been plenty of time for this to happen.

Mr. Lake also stated that he had seen the orbital reflex in toxic conditions—particularly in acute staphylococcal mastitis.

Mr. W. Beaumont asked the speaker if could explain a phenomenon which he had seen almost constantly in cases of acetonaemia, *viz.*, that when cows "circled" with this condition they always circled to the left.

The Reply

Professor McCunn thanked Mr. Smythe for opening the discussion and also for the kind way he had treated him. The President had not only asked some profound questions, but he had added considerably to the subject matter. He agreed with him that there had been greater progress in diagnosis than in treatment. What was the good of knowing all about a disease if one was at a loss as regards treatment? For some time it had become increasingly evident that some people thought that diagnosis was the be all and end all and this view had been pushed to the detriment of therapeutics. He was one who deplored the modern contempt for that essential part of the curriculum, their old friend "Mat. Med. and Therapeutics." Our young men were losing the art and craft of pharmacy and the compounding of prescriptions from simple inexpensive drugs. We were getting more and more in the hands of the proprietary drug merchants and their expensive nostrums, with consequent damage to our clinical skill and incidentally to our own and our clients' pockets.

As a rule, damage to brain tissue was irreparable and the commonest cause of damage was, he thought, some virus. He agreed that many modern dogs were completely neurotic. Indiscriminate breeding from any sort of parents, often from bad stock and closely related, was a potent factor. After the war the demand for pets was so great that breeders, in haste to "cash in," ignored many of the rules. They were after quantity rather than quality. The same thing happened after the 1914-18 war and the highly neurotic unstable Alsatian of the 1920s was the result.

He did not agree that cats never suffered from hysteria. He had seen a number in what might be called a state of hysterical frenzy. He remembered one case in particular. It belonged to the matron of a large London store. It galloped round and round her room, leaving a trail of broken fancy china and other "whatnots" such as one might find in a spinster's sitting room. It was caught and controlled with the greatest difficulty and not without some personal danger.

In cases of paraplegia one seldom saw any macroscopic changes. In some one might find evidence of haemorrhage under the meninges. Dachshunds seemed to very susceptible and he had thought that this might in some way be connected with the extreme length of the back. Dogs which could not empty the urinary bladder except with pressure assistance were no doubt affected with paralysis of the muscular wall, but the one which "dribbled" was in most instances a case of retention with overflow. The urine flowed when the level of the urine became higher than the brim of the pelvis. He had heard reports that stilboestrol was good in such cases. How it worked he did not know. In fact did anyone know how it worked in such conditions as anal adenoma? It did work, however, and in many cases he had seen inoperable tumours resolve when the patient had been given the agent by the mouth.

With reference to prolapsed disc, it was the modern fancy to attribute lots of things to dislocation or squashing of the disc. He lent his friend the local "sawbones" an article on this subject. It was profusely illustrated by diagrams. After he had perused this it was remarkable how many patients, who would in former times have been diagnosed as suffering from lumbago, suffered from this intriguing malady. One case occurred last Saturday night. The disc (?) resolved after ½-grain of morphia.

Calcification of discs did occur in perfectly normal animals, but he could not subscribe to this calcification being the cause of all

sorts of things, including paraplegia. He, like Mr. Smythe, had observed it in the cervical region in gun dogs and greyhounds. It might be associated with the catching and carrying of game and the extra strain put on the neck.

Lesions due to virus injury were, as a rule, slowly progressive and there was no regeneration of tissue. It was strange, however, that some cases did seem to recover if given time. One could only conclude that the damage was in some non-vital spot. Many parts of the brain could be surgically removed and the patients carried on quite all right afterwards. He had not referred to the autonomic system for the simple reason that he was not well informed. Head shaking in horses was commoner now than it used to be. Sometimes the cause was obvious, such as some affection of the external ear, dirt, parasites, etc., and good results followed the use of a bland oil as a detergent. Other cases improved if put on iodide, preferably that of mercury and arsenic, *i.e.*, Donovan's solution. There were many cases for which we could do nothing; we could not ascertain the cause and the animal was a perfect menace. Referred pain was always associated with some branch or connection of the nerve or segment of the cord which was involved in the original trouble. It was, therefore, specifically regional and in the human helped considerably in diagnosis. For instance, in certain heart affections, *e.g.*, coronary occlusion, one got pain down the arms and in such things as gastric ulcer one might get pain between the scapulae. Biting of the tail in dogs and monkeys was a form of peripheral neuritis. That was often associated with a vitamin B deficiency and yeast was very useful. Pain about the tail or anus seemed to react well to aspirin.

He agreed with Mr. Smythe that the peculiar form of eye blinking seen in calcium deficiency might also be noticed in magnesium deficiency.

Dr. Blount did not ask him questions, but instead gave them some useful information regarding nerve trouble in poultry, and for this he thanked him.

In reply to Mr. Hughes, calves and occasionally other animals did suffer from blindness due to pressure on the optic nerve as it issued from the cranium. In these cases there was evidence of bone changes in the skeleton and round the foramen one found that the bone was rarefied and small lumps were formed. These pressed upon the optic nerve. The trouble was basically a deficiency one and could be remedied in its general effects, but unfortunately if the nerve was damaged there was little chance of restoration of sight. The dog case which Mr. Hughes mentioned, with a partial paralysis of the hind limbs and ataxia in the fore limbs was an interesting one. Its vision also was affected, so the chances were that the lesion was central, *i.e.*, cranial. As there were remissions he would hazard that the trouble was extra-cerebral: it was near the pons varolii and was probably due to periodic over-distention of the cisterna basalis.

Mr. Auchterlonie had noticed the orbital reflex in milk fever and in tetany. He might also have noticed the twisting of the neck in milk fever, *i.e.*, a form of torticollis which he thought had the same cause, *viz.*, a hypocalcaemia.

Mr. Auchterlonie instanced rupture of the flexor metatarsi in horses. He (Dr. McCunn) had seen a few cases. One also got a rupture of the antagonistic muscle, *i.e.*, the gastrocnemius, and in a recent case it was some time before he could say which was involved. After a prolonged examination he found a slight rupture at the tendinous extremity of the gastrocnemius. He also alluded to congenital deafness in dogs, and agreed with him that this was true nerve deafness. He, like himself, had some specialist evidence which implicated the organ of Corti in the internal ear.

One did get a retinitis with glycosuria. It was one way of spotting glycosuria, but that trouble was comparatively rare in our patients.

In reference to the remarks of Mr. Eaton, in the orbital reflex in calcium and magnesium deficiency the sensory areas were hypersensitive.

In answer to Mr. Carr: There was a cult the subscribers to which believed all ills were due to abnormalities of the vertebral column and interference with the central nervous system. They often worked immediate and wonderful cures by manipulation. The essayist then demonstrated on Mr. Lake a method for the relief of headache. In the case quoted by Mr. Carr probably his medicinal treatment cured the trouble and the bone setter got the credit.

Affections of sight, referred to by Mr. Sutton, were common in deficiency disease: A, B and C deficiencies. He had seen this in dogs and no doubt it might also occur in calves. He had had good results after giving cod-liver oil, yeast and ascorbic acid.

Mr. Wilkinson had mentioned Ménière's disease. This was associated with the internal ear, *i.e.*, the semicircular canals. He had no definite *post-mortem* evidence of its occurrence in animals. The case he and Mr. Lake mentioned had lesions in this site, but he forgot their exact nature.

Mr. Lake had also asked about head shaking. He was in entire agreement with him as regards its frequency and our helplessness in many instances. Eye rolling and nystagmus also occurred in many toxic states: they were one of the indications of chloroform toxaemia.

Mr. Beaumont had asked him why in acetonaemia animals circled to the left. He did not know, but he believed that when circling occurred in any animal in a mineral deficiency state it was more often to the left than to the right.

Dr. McCunn concluded by thanking the members of the Derbyshire Division for the kind way in which they had received his paper, saying that he was specially pleased by the concourse of youth that was present. He had been afraid that there would be little discussion, for they were breaking new ground. The discussion had been good: it gave evidence of the ordinary veterinary surgeon's powers of observation and he hoped that that would not be the last paper on the nervous system, for it covered a great field and the door was wide open.

STREPTOMYCIN CONTROLLED

Commenting on the imposition of restrictions on the sale of streptomycin, the *Pharmaceutical Journal* observes that it is something of a rarity to find an instance where control is applied because the substance concerned is becoming available in increasing amounts, and continues: "The Streptomycin Regulations, 1948, which came into force on August 1st, some days before any copies of the Regulations were available to those affected, make streptomycin subject to the Penicillin Act, 1947. The effect is, broadly, to make it an offence to supply streptomycin, and preparations containing it, to the public, except on prescription and then only on a single occasion, unless the prescription otherwise specifically directs. The Penicillin Act as issued applied only to penicillin and its preparations, but it contained a provision whereby other substances could by Regulation be made subject to the same control, and streptomycin is the first addition to be made in this way. The name of the Act is thus made somewhat inappropriate and will become more so as, with the passage of time, further substances are brought within its ambit.

"The Regulations will have but little practical importance for either manufacturers or pharmacists, since there is as yet no indication that streptomycin will be issued in the form of preparations which the public might wish to use for self-medication. Administration is by injection, and injections must be given over a long period. In commenting on the Penicillin Act, we doubted whether the risks of inducing either sensitivity or resistance were sufficient to justify preventing the public from obtaining simple preparations such as lozenges or ointments, except on prescription. In criticising this view Dr. Young, member of Council, pointed out the necessity of avoiding a repetition of experience with sulphonamides, where, as he said, the occurrence of resistance did not become apparent until a couple of years or more after the introduction of the drug. One of the known disadvantages of streptomycin is the frequency and rapidity with which resistance develops and inadequate initial dosage must be avoided. However, the probability that if free to do so the public would purchase the drug for self-administration parenterally is somewhat remote. Whether the tuberculous, or their friends, would obtain supplies in the vain hope of effecting a cure by oral administration is another matter. Previous experience with antituberculosis drugs given parenterally, such as gold and sodium thiosulphate, suggests a negative answer, but perhaps the frequent broadcast appeals for streptomycin and the known value of penicillin have conditioned the public to expect from the new substance a good deal more than is warranted by the results so far published."

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Medical Research in U.S.A.

Within the next ten years it is proposed to increase the amount of money spent in the United States of America on medical and allied research from 100 million to 300 million dollars a year. This proposal is contained in the recently published volume five of the report by the Steelman Committee which was set up by the President in October, 1946, to consider what measures should be taken to develop a dynamic national scientific research policy in the U.S.A. To co-ordinate the policy it is suggested that a medical research advisory committee be established at once to be charged with large scale, long range, planning. In order to ensure efficient operation, furtherance of necessary programmes, and the best possible work in the field of medical research, it is suggested that scientists be recommended at every stage of organisation and administration by officials who have a thorough understanding of scientific needs.—*Pharm. J.*

CLINICAL COMMUNICATIONS

Suggested Technique for Dishorning Adult Cattle

W. B. QUARMBY, M.R.C.V.S.
BEVERLEY

Various articles and opinions in the farming Press have stimulated Ayrshire owners and breeders to have their herds dishorned. In order to simplify what has hitherto been a somewhat long and arduous undertaking, a technique is outlined below which gives the minimum of trouble to both operator and patient.

(1) The cows are tied up in their standings, the hair round the root of the horn being clipped short. They are then secured with nose grips and a halter and anaesthetised.

APPLICATION OF A TOURNIQUET (*See Diagram*)

(2) A piece of binder twine is used to make a clove-hitch (A) and is adjusted so that it encircles the poll, fitting snugly into the grooves between the horns and ears. Another length of twine is slipped beneath one of the sides formed by the loop of the clove-hitch, passed over the top of the poll and then underneath the other side of the loop (B, C). It is then adjusted so that it is about half an inch from the root of one of the horns, and the free ends (B, C) are tied tightly. The same thing is done close to the other horn. This tourniquet will not come off after the horns have been amputated.

(3) For amputating the horn, a hack-saw with a fresh blade for every cow is used, as this facilitates quick removal. The saw cut is made about a quarter of an inch within the hair line, so that the final result gives an appearance of a perfect poll.

(4) Normally the cut surface is left without any dressing at all, but some owners prefer to have a dressing of Stockholm tar applied on completion of the excision.

(5) The tourniquet is taken off after 24 hours.

Remarks.—This method of de-horning is very satisfactory in that there is little haemorrhage—this being an enormous advantage which will be self evident to those who have amputated horns without using the tourniquet herein described.

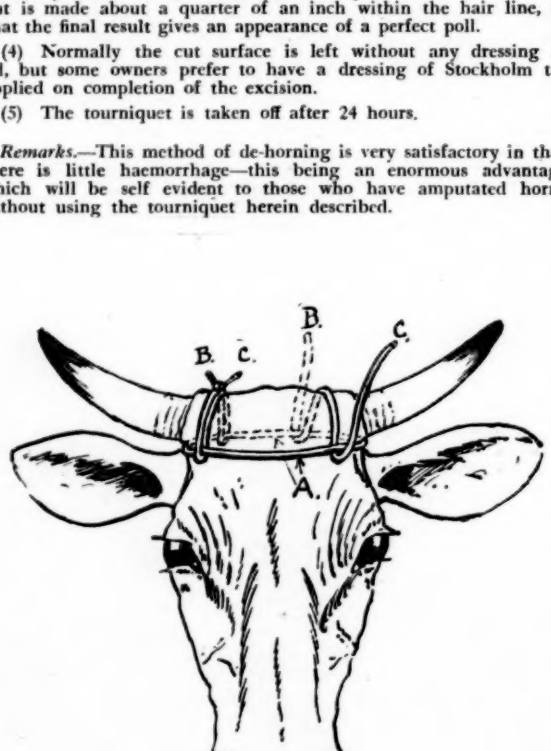

DIAGRAM OF TOURNIQUET DESCRIBED
BY W.B. QUARMBY, M.R.C.V.S.

Dishorning of Adult Cattle

C. T. MURPHY, M.R.C.V.S.
COLCHESTER

A simple procedure is to secure the animal to a post with the halter and adjust a Cox's chloroform mask, embracing the entire muzzle and pulled up on the face as far as possible. To facilitate this the nose piece of the halter may have to be on the outside of the mask. A rope is placed on one of the hind shanks and held by two men to prevent the animal blundering about and perhaps causing an accident. One-and-a-half to two ounces chloroform are sprinkled on a pad of soft cloth or towel, about 12 inches square, and introduced into the mask, the end of which is now closed and covered with a piece of canvas to exclude as much air as possible. The animal soon lies down and when a state of complete anaesthesia is reached the head should be held in a position to suit the operator and the horns are amputated as quickly as possible. The chloroform mask, halter and leg rope are removed and the animal is allowed to rise after a few minutes. Amputation should be effected at a point about a quarter inch inside the skin border. If this is done the skin will grow rapidly over the wound and prevent the further growth of horn. As a rule no dressing of the cut surface is required although some operators apply Stockholm tar and others bandages. One operator I had the pleasure of watching used no tourniquet whatever, but very successfully reduced haemorrhage by simply laying a small piece of cellulose wadding on the cut surface. This material is very light and adheres easily and seems to encourage clotting of the blood. In some herds it is found necessary to keep the animals separate or tied up after the operation for as much as 24 hours to prevent their fighting or butting each other. There are several types of dishorning shears on the market to choose from, but a strongly constructed model is to be preferred. A butcher's saw, with ten teeth to the inch and set on the cross, is used by many and is quite effective. Cows in milk show a drop in yield for a couple of days after the operation, but usually rise to normal about the third day. The operation should not be carried out during the fly season or in very wet weather unless suitable precautions are taken.

* * * * *

Dishorning Cattle

N. F. POLLOCK, M.R.C.V.S.
WEST RUNTON

Preparation.—Cows are fasted overnight; heifers at grass may be yarded that morning. A spacious yard littered with clean straw and provided with numerous pillars, rings, etc., to which the stock may be secured is regarded as essential.

Control.—A rope is secured around the horns and the animal drawn as close as possible to the post, around which the rope is wound twice, then back on itself close to the horns, being held thus by an attendant.

A Cox's muzzle is placed over the mouth and nose, the chloroform having been poured into clean dry sacking (chaff) in the bottom of it.

In one to two minutes the beast falls down, the rope being eased if necessary. If it hangs back on the rope a push from one side will send it over. The rope is removed and each horn severed close to the skull with the guillotine, the underneath one first. The mask is withdrawn and a binder-twine ligature tied as tightly as possible around the horn stumps. Sometimes insufficient rim is left to afford lodgment for the cord and bleeding continues until clotting occurs naturally.

Considerable force is required to close the arms of the instrument in the case of adult Ayrshire cows, etc., and the aid of an attendant may be necessary at times to ensure this.

Dosage.—The writer starts with 1½ oz. on cows. This may be reduced to 1¼ if vaporisation is good; and to just over one oz. in young cows when the work is proceeding so quickly that the sacking bears the residue of previous doses. The sacking is rotated after each time of use and changed after four times. Heifers and steers 1½ to two years old receive one to 1¼ oz.

A lesser dose is generally too slow-acting and needs augmenting. Graduations are made down to two drams for a six month calf. An adequate dose initially ensures unconsciousness within two minutes or so and the period of inhalation is thereby reduced to a minimum with consequent lessening of mortality risk, and expedition of the work.

Mortality.—The writer has had one death in 170 operations. A milking cow inadequately fasted expired whilst the second horn was being sawn off. (She was bled and at once sent to a Ministry of Food slaughterhouse where she realised £40). The saw has been discarded in favour of the guillotine which is quicker and less tiring.

General.—Team-work helps greatly. The writer measures out the chloroform, applies the mask and operates the instrument. Attendants are responsible for catching and securing the cattle, removing the muzzle, tying the ligature and carrying the guillotine from beast to beast. Working thus 22 heifers have been done in 1½ hours but extreme speed is not aimed at.

By Chemical Means

James E. Guthrie (*J. Amer. vet. med. Ass.*) reports his experiment on 47 young calves of six common breeds using one of six chemical formulae. The best was antimony trichloride 28 per cent., salicylic acid seven per cent., flexile collodion 65 per cent. This avoided the marked local irritation of ordinary caustics, was non-toxic, impervious to water and did not harm the dam. It was effective in calves aged one to 14 days.

The writer has corroborated this in the case of Shorthorn calves in Norfolk. When they are over 14 days with horn buds in evidence it is necessary to slice their apex before applying the lotion.

ABSTRACT

[**The Control of Some Virus Diseases.** Manley, F. H. (1948.) *Auburn Vet.* **4**. 63.]

The author outlines the control of the more important virus diseases and shows how control measures differ with the epidemiology of the disease.

Foot-and-mouth Disease.—Characterised by rapid spread, three immunological types, and immunity of short duration. Where the possibility of eradication exists, the slaughter policy, with standstill orders and adequate disinfection is the method of control. Under other circumstances, quarantine and immunisation. Where the movement of animals and animal products is not adequately supervised control is difficult.

Hog Cholera.—Host specific, one type of virus and possibility of conferring a lasting immunity. Infection persists in chilled, pickled and smoked meats and swill is an important source of infection. Contact with pigs in the early stages of the disease, makes transportation and sale yards a dangerous focus. Control includes the compulsory boiling of swill and immunisation before passing through sale yards. Methods of immunisation are discussed and the wide use of crystal violet vaccine is considered the best means of reducing the incidence of the disease.

Rinderpest.—Still a major plague, especially in Africa, Asia and India. Infection is by contact with infected animals or animal products. Lasting immunity follows recovery. Quarantine and the production of active and passive immunity are means of control.

Equine Encephalomyelitis.—Several virus types; transmission principally by mosquitoes (*Culex* and *Aëdes*). The domestic fowl may be a reservoir of infection. Measures of control are directed against the mosquito, together with the judicious use of a chick embryo vaccine, administered intradermally.

Swamp Fever.—Often complicated by the absence of clinical symptoms, and no laboratory means of diagnosis. Transmission is by insect and infection by ingestion may occur. Where possible the slaughter policy is the best control; alternatively, isolation and quarantine measures.

P. K.

AGENIZED FLOUR

Discussion in our columns of the possible role of agenized flour in the causation of canine hysteria may have prompted in the minds of some of our readers the question asked and answered as follows in a recent issue of the *British Medical Journal*:

Q.—*What is "agenized" flour and why has it been adopted for general use both by ourselves and by the Americans?*

A.—"Agene" is the trade name for nitrogen trichloride, which in the pure state is a very unstable compound. It is prepared commercially in impure form by passing chlorine into an aqueous solution of an ammonium salt. A current of air containing about one per cent. of agene is then passed into the flour, with adequate agitation, until a sufficient quantity has been absorbed. Agene has a strong bleaching action, but it also "improves" the flour so as to give a tough tenacious dough which bakes into a large porous loaf. Its trade name suggests its function in artificially ageing and maturing the flour. Reasons for the use of agene in preference to other bleaching or improving agents presumably lie in the ease and cheapness of its industrial application and in its efficiency in producing the desired properties in the flour.

REVIEW

["**The Scientific Basis of Kindness to Animals.**" By John R. Barker, M.A., D.Phil., D.Sc., Lecturer in Zoology in the University of Oxford. Published by the Universities Federation for Animal Welfare, 284, Regent's Park Road, Finchley, London, N.3.]

Without a footnote which indicates that the paper is based on the first part of an address on the "Science and Philosophy of Kindness to Animals" the title of this paper might be considered misleading. The author explores the question of what constitutes pain in an animal, with a view to developing techniques that will minimise pain, particularly in experimental animals. There is no doubt that in some of the lower orders it is difficult to distinguish pain from reflex response and the author approaches his subject from an anatomical point of view and considers that the absence of a highly developed central nervous system precludes participation in consciousness. He mentions the absence of ordinary sensation in the intestine and draws attention to the similarity of the nervous mechanism present to that of a sea urchin. Developing his argument, he says that it would be illogical to grant permission to cut the human intestine because it might have a consciousness of its own and refuse to carry out an experiment on a sea anemone. Fortunately the dividing line more or less coincides with the biological distincton between vertebrates and invertebrates but even in these latter, where there is a highly developed nervous system as in the crab and the octopus, the author counsels that consciousness might be present and steps should be taken to avoid pain.

MINISTRY OF AGRICULTURE NEWS SERVICE

Importance of Sheep

Our sheep population has fallen by more than a quarter since 1939, and there is little sign yet of any recovery. But now is the time for every effort to increase our flocks. A million more lambs bred and fattened next year would prove a very valuable addition to our home-produced meat supplies. And sheep can be bred and fattened on a lower scale of supplementary feeding than any other farm animal: and that is important to-day with such severe restrictions on cereals and oilseed by-products for stock feeding. Having a much shorter breeding, rearing and fattening cycle than cattle, sheep can do much more to help our food problem than is generally recognised. Going through parts of England to-day, one is impressed by the absence of sheep from many farms where they should be kept. Many thousand acres of productive new leys have not enough livestock to graze them efficiently.

Why are sheep so unpopular? They are still kept on the hills and moorlands because there is no alternative; but on mixed and mainly arable farms they are disappearing fast. Yet on the mixed farms we should now be increasing our sheep, not in competition with dairy cattle, but as supplementary livestock. What unconsumed waste there is—waste of undergrazed leys and stubbles, ploughing-in of sugar-beet tops and market garden crops, untrimmed growth on hedge banks: all potential meat and animal fat—very scarce in the world of to-day.

It is easy to explain the rapid decline in flocks kept under wholly intensive folding conditions on the eastern and southern arable farms. The wholly arable system is costly in labour, though it will always persist in pedigree ram breeding Down flocks. But there is much scope for developing mixed farm flocks fed on tillage crops during winter and spring, and grazed on leys the rest of the year. And we must get rid of the idea that sheep are a lot of trouble for the profit they make. Such great advances in disease control have been made during the past two decades that flockmasters generally have not kept pace: for example, phenothiazine to control stomach worm infestation, D.D.T. preparations for maggot-fly strike, modern serum and vaccine treatment against diseases like "pulpy kidney" and lamb dysentery.

At present-day guaranteed prices for mutton and lamb, a sheep enterprise should be profitable, if we keep down losses and manage the flock to get a good crop of lambs. It is essential that sheep should make a proper contribution to the four-year expansion programme.

* * * * *

Weekly Wisdom

If any or all of the Government's nationalisation and rationalisation schemes end in failure one reason will tend to overshadow all others. That reason will be bureaucratic inability to dispose of a problem quickly.—Farming News.

Questions and Answers

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Dead Mixed Vaccine in the Control of Mastitis and Metritis

Q. CCLVII.—*Is there any experimental evidence that the inoculation of a dead mixed vaccine is of any value in the control of mastitis or metritis? If there is such evidence, why is the use of such vaccines not recommended by the N.V.M.A.? If there is no such evidence how is it that firms are able to sell such preparations to members of our learned profession?*

A.—Dead mixed vaccines have been used in the field in both mastitis and metritis for many years. Some regard them as useful whilst others are equally emphatic that they are of little or no value. In neither disease are there records of controlled trials of mixed vaccines.

Mastitis.—Trials with pure vaccines against the organisms most commonly concerned, mostly herd autogenous vaccines, have shown that neither streptococcus nor *C. pyogenes* vaccines are of value, but that staphylococcus and coliform vaccines may be. Similarly, as regards toxoids, there is no evidence that *C. pyogenes* toxoid is of much value, but some that staphylococcus toxoid may be.

Metritis.—In metritis the most common bacteria are *C. pyogenes* and staphylococcus. No controlled trials appear to have been reported.

In the case of both diseases satisfactory conclusions can only be reached by vaccinating one part of a similarly exposed group of animals and leaving the others unvaccinated, because the incidence varies widely from place to place and from year to year. This is particularly obvious in summer mastitis, in which trials on up to and over 1,000 animals, and farms, which showed an over-all incidence of 15 to 20 per cent. in one year, have shown in the following year when under experiment an incidence of a few per cent. in both vaccinated and controls. Without the controls the conclusion might have been reached that the vaccine was of high value but it is this variation which probably accounts for the high regard in which vaccines are held by some and not by others, and the fact that the vaccine is sometimes used for a period with good results, then fails.

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Retention of Meconium

Q. CCLVIII.—*Is retention of the meconium a specific disease or a symptom of joint-ill?*

A.—Retention of the meconium is nothing more than constipation, and if the impacted meconial mass is removed by sponge forceps or by a scoop until there are no more lumps coming back and the rectum contains soft yellow faeces then the constipation no longer exists, the foal stops straining and, usually, after taking a feed lies down for a much-needed rest. He may be considered cured.

The cause of the constipation is not known. Experiments with feeding, management and dosing of mares have, so far, not produced any satisfactory reduction of cases.

There is, in the writer's firm opinion, no infectious organism, joint-ill or other, connected with the condition of retained meconium.

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Canine Euthanasia

Q. CCLIX.—*For destroying dogs, is there any method* PROVED *to be painless, apart from nembutal. Saturated mag. sulph. intravenously does not appear to be effective in* 10 *c.c. doses; and chloroform* (5 *c.c. intra-thoracically*) *has very variable results* (*and causes distress*). *When strychnine is used, does anyone* KNOW *at what stage consciousness is lost?*

A.—In skilled hands the use of the captive bolt pistol (Cash or Temple Cox) is undoubtedly painless since loss of consciousness, due to destruction of the cerebrum, is instantaneous.

Many people, including investigators on behalf of various animal welfare societies, believe electric euthanasia to be the perfect method; there are, of course, numerous technical difficulties about the fitting of an electric euthanator in the average surgery premises, apart from the initial cost; in addition, the writer is not absolutely satisfied that electric euthanasia is as painless as is usually claimed.

Saturated solutions of magnesium sulphate given intravenously or intracardially are very effective if given in sufficient dosage and care is taken to ensure that a warm, fully saturated solution is used. 10 c.c. is sufficient only for small dogs, hence the questioner may have obtained unsatisfactory results in dogs of medium size. Doses of 20 to 30 c.c. are needed for dogs of 40 lb. and upwards to ensure rapid, and apparently painless, death; the rapid injection of so great a bulk naturally creates certain technical difficulties over bore of needle, size of syringe, etc., hence the limitations of this method.

So far as the writer is aware, the use of strychnine has never been regarded as painless and it is generally accepted that death is due to asphyxia from spasm of the intercostal muscles and that consciousness is lost at a comparatively late stage due to anoxaemia of the brain. The use of a mixture of strychnine and prussic acid advocated by some as being an excellent method has given results of a very dubious nature in the writer's hands and was rapidly discarded after a reasonable trial.

Many practitioners state that a full dose of morphine injected intraperitoneally rapidly produces narcosis, and that Scheele's HCN similarly introduced will prove fatal without noise or pain. The writer has no personal experience of these methods.

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Coprophagy in a Bitch

Q. CCLX.—*An 18-months-old fox terrier bitch shows a marked inclination to eat her faeces or that of any other dog, and following this, often falls into coma. She has been treated for worms and also has received a course of vitamin B_1, but so far has made little progress. Can you suggest the cause and also any suitable treatment?*

A.—One of the several respondents we have sought, without better success, writes: "I, too, would be grateful to see the answer to that one. In my opinion it is a vice such as weaving in the horse, or crib biting, and I have been quite unable to cure it in the greyhound. It is learned as a puppy in the run and in my hands has not been responsive to treatment despite worming, mineral additions, charcoal administration, etc. The only treatment I know is preventive, *i.e.*, keeping clean runs and avoiding ennui. A pet dog might be amenable to a stick!

Horses, too, will eat warm faeces, as happened in France in the 1914–18 war. They developed a high sense of ingenuity in stretching the head rope so that the dung would be well placed, then 'reversed' so that they could eat it. That was a cold weather vice."

The field of response is open to our readers.

Trivia

One of the bits of advice that I hope to hand on to my sons when they come to set up house is that in choosing a dog one should consider the colour of one's stair-carpet. To keep a large off-white dog, as we do, when your stair-carpet is a plain royal blue is asking for constant trouble. For it is quite a mistake that dogs moult only at certain short seasons; ours gives off an effluvium of hairs all the year round, with a smart exacerbation on Saturdays, after I have given the stairs their weekly vacuum cleaning.

The ideal, no doubt, is to have a patterned stair-carpet and to choose a dog if not of the same pattern, which may be hard to find, at least of the same colours, so that a handful of fur will pass as a variation in the design. Failing that, dog and carpet should tone with one another; you can have either a dark carpet and a dark dog or both light. There is one snag in this: if the dog exactly matches the carpet you may step on him when coming downstairs, and if he is a quiet dog you may lose him in the darker corners of the landing.

If you are lucky enough to have carpets in your rooms as well as on the stairs a correct match is still more important; chair covers, sofas, and bedspreads (if you allow your dog in the bedrooms) do not matter so much, because dog's hairs do not dig themselves into these things as they do into carpets. It may be very awkward if you have different colour schemes about the house. If—to take an extreme example—your rooms are carpeted in pale beige and your stairs in nigger brown the only solution is to change over to some hairless pet; a pig might do, but to be on the safe side I would recommend either a tortoise or a snake.

When I told Jones about this he said he would extend my advice to include wives, since they also scatter their hair about on newly hoovered pile. But I think he is going too far. In my experience wives do not moult like dogs; and the young man with brunette furnishings who marries a blonde can always train her to wear a hat except in the kitchen and bathroom.—A *Lancet* "Peripatetic Correspondent."

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At the Frontier

Czechoslovak dog: I should like to come across into Austria for a bit.

Austrian dog: Don't be silly. You're fat. Just look at me. There's nothing to eat in Austria.

Czechoslovak dog: I know, but at least I could have a good bark.

NOTES AND NEWS

Diary of Events

Sept. 8th to 15th (inclusive).—N.V.M.A. Congress at Southport.

Sept. 11th.—13th Annual Meeting and Dinner of the Royal (Dick) Veterinary College, Alumnus Association at Southport (Prince of Wales Hotel), 7.30 p.m.

Sept. 14th.—Meeting of Society of Veterinary Practitioners, in the Assembly Room, Cambridge Hall, Southport, 2.30 p.m.

Sept. 14th.—Annual General Meeting of the Association of Veterinary Teachers and Research Workers, in the Council Chamber, Town Hall, Southport, 3 p.m.

Sept. 17th.—Meeting of the North of Ireland Division, N.V.M.A., at Belfast (Ulster Farmers' Union Hall), 7.15 p.m.

Sept. 17th.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington, 2.15 p.m.

Sept. 18th.—Annual meeting of the North of Scotland Division, N.V.M.A., at Bucksburn (Veterinary Laboratories, Mill of Craibstone), 2 p.m.

Sept. 23rd.—Special General Meeting of the South-Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 6 p.m.

Sept. 24th.—Meeting of the South Wales Division, N.V.M.A., at Carmarthen (St. Peter's Church Hall), 2 p.m.

Sept. 29th, 30th, Oct. 1st.—R.C.V.S. Committee and Council meetings, 10, Red Lion Square, W.C.1.

Oct. 6th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.

Oct. 7th.—Meeting of the Central Veterinary Society at the Royal Veterinary College, 2 p.m.

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Southport Congress, 1948.

Col. W. L. Sinton, M.B.E., M.R.C.V.S., will open the discussion of the paper to be presented by Mr. A. C. Shuttleworth, M.V.SC., F.R.C.V.S., on "Dental Diseases of the Horse," at 2.30 p.m. on Thursday, September 9th, in the Cambridge Hall, Southport.

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PERSONAL

Birth.—Watson.—On August 30th, 1948, at Twyford Nursing Home, Bognor Regis, to Barbara (*née* Jewell), wife of C. Brian Watson, M.R.C.V.S., the gift of a son—Philip Mark.

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Mr. M. Park's Election to the Society of Authors.—We are pleased to note that at the meeting of the Committee of Management of the Society of Authors held on August 25th, Mr. Malcolm Park, M.R.C.V.S., of Crawley, Sussex, the veterinarian whose novel, "The Honest Rogue" was so favourably reviewed in our columns last year, was elected to membership of the Society, of which Mr. John Masefield, the Poet Laureate, is president.

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Forthcoming Marriage.—Bateson—Stubbs.—The engagement is announced between Thomas Clifford, second son of Mr. and Mrs. G. E. Bateson, of Sefton Park, Liverpool and Phyllis only daughter of Mr. and Mrs J. R. Stubbs, of Beech Field, New Longton, Near Preston.

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R.C.V.S. OBITUARY

Currie, John Magee, 28, High Street, Lowestoft. Graduated Dublin, July 12th, 1916. Died August 20th, 1948; aged 56 years.

Mr. J. M. Currie, M.R.C.V.S.

For over 30 years Mr. John M. Currie, whose death we record with much regret, had been well known among the agricultural community of North-East Suffolk. Until war-time feeding difficulties interfered, Mr. Currie was a prominent breeder of Sealyham and fox terriers. He leaves a son, a veterinary student, and two daughters. Mrs. Currie, who died six years ago, was a daughter of the late Mr. James B. Stansfield, who for two periods was manager of Norwich City Football Club.

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THE XIVth OLYMPIAD

During the 15 days of the Olympiad, the United Kingdom welcomed many thousands of visitors from all over the world, 25 new Olympic records were established and the British Commonwealth played a creditable part, gaining nine first places, 26 second and 14 third, covering almost every type of event. So far as is known, the only competitor with veterinary interests was Mr. L. McKeand, who is an Australian veterinary student (fifth year). He competed in the 'Hop, Step and Jump.'

Mr. G. P. Male was appointed in March last by the British Horse Society to be Veterinary Officer to all the horses—possibles and probables—which were to take part in the Equestrian Events, a position of great responsibility. For this he has received the Olympic Medal and a letter of appreciation.

For the Prix des Nations at Wembley, Mr. H. W. Steele-Bodger was appointed by the British Show Jumping Association as Senior Veterinary Officer, and he had as his assistants Mr. E. P. Barrett, Mr. T. A. M. Chambers, and Mr. W. L. Dwerryhouse. For his services Mr. Steele-Bodger also received an Olympic Medal and letter of appreciation.

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THE INTERNATIONAL HORSE SHOW

Several veterinary surgeons and/or their wives were among the competitors at the International Horse Show, which event also proved a great attraction in London.

Colonel C. H. S. Townsend's hunter 'Clonard' ridden by Mrs. Townsend, won the Field Challenge Cup for the Best Hunter in the Show, and was reserve to Mr. Eric Wilson's 'Holyport' for the Schweppe's Challenge Cup for the Best Ladies Hunter. 'Clonard' was also reserve to Mrs. R. Cooke's 'Knobby' for the Supreme Champion Riding Horse. Colonel C. H. S. Townsend's grand twenty-year old chestnut mare 'Big Sweep,' again ridden by Mrs. Townsend, won the Horse and Hound Cup for the Open Jumping Competition. Mrs. M. P. Beckett, of Blandford, was placed third in a very strong class for the Best trained Riding Horse (Dressage Test), with her chestnut mare 'Barley's Gift,' and Capt. F. Beckett was exhibiting in the class for the best Weight-Carrying Cobs. Mrs. G. F. Banham was placed fourth with her chestnut hunter 'Thomastown' in the class for the best light-weight hunters.

Mr. H. W. Steele-Bodger was appointed Chief Veterinary Officer to the Show and had as his assistants, Mr. E. P. Barrett, Mr. W. L. Dwerryhouse, and Mr. T. A. M. Chambers, deputising for Mr. T. L. Wright who as readers know was unfortunately in hospital following a bad accident.

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ANIMAL HEALTH TRUST

Appointment to a Wellcome Veterinary Research Fellowship

The Animal Health Trust announces the appointment of Mr. Alan E. Pierce, M.R.C.V.S., D.V.S.M., to a Wellcome Research Fellowship at £600 per annum.

Mr. Pierce, who qualified M.R.C.V.S. in 1941, did a post-graduate course in veterinary state medicine, and then joined the veterinary staff of the Birmingham Corporation. Later, he carried out researches into pining in sheep in North Wales under the direction of Mr. Rowlands, under the A.R.C. A short break in practice preceded his appointment to the Ministry's Veterinary Laboratories as a Research Officer in 1943.

Since that time he has been working on trichomoniases in cattle. One of the difficult problems of this form of sterility in cattle is its accurate diagnosis. Mr. Pierce has developed a test which promises to be most helpful in this respect.

With the Wellcome Fellowship, Mr. Pierce will go to the U.S.A., where he will continue his work, in particular, under the supervision of Professor B. B. Morgan, of Wisconsin University, Madison, who is an acknowledged expert on this and other parasitic conditions of domestic animals. Wisconsin is the largest dairy cattle state in the U.S.A., and the University has the largest veterinary research staff working on sterility and other dairying problems. Mr. Pierce will work upon the chemotherapy of the trichomoniases, with special reference to the treatment of the bull. Whilst in North America, Mr. Pierce will visit other centres of veterinary parasitology in the United States and Canada.

Mr. Pierce will be the second research worker to be sent by the Animal Health Trust to America this autumn, Colonel Hickman having recently gone to the Franklin Institute. Altogether, five veterinarians have now been to the United States under the auspices of the Trust.

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FOWL PEST

On Friday of last week the Ministry of Agriculture and Fisheries made the following announcement:

The Minister of Agriculture and Fisheries is satisfied that some parts of England and the whole of Wales can now safely be freed from restrictions on the sale, exhibition and movement of poultry. As, however, outbreaks of fowl pest continue to occur in other areas of England, restrictions must still be maintained in the eastern, southern and midland counties of England, as well as in Yorkshire, Lancashire, Cheshire and Stafford.

A new order has, therefore, been made which will come into force on September 1st. In effect it divides Great Britain into three areas namely:—

Area 1. The area where restrictions are still necessary.

Area 2. Scotland and the counties of Northumberland, Durham, Cumberland and Westmorland, and the Furness Division of Lancashire.

Area 3. Wales and the remaining counties of England.

In Area 1 the holding of sales and shows of poultry and the

movements of poultry from premises on to which other poultry have been taken within the previous 28 days are prohibited generally but sales of poultry may be authorised by Local Authorities. Provisions are included in the new Order relating to the movement of poultry to sales and restricting the movement of birds out of Area 1. In addition the exhibition of poultry at shows is prohibited unless the holding of such shows is specially authorised.

In Areas 2 and 3 the holding of poultry markets and of poultry shows is entirely unrestricted and movement in those areas is not controlled, but movement from Area 3 to Area 2 is prohibited and movement from Area 2 to Area 3 is prohibited if the movement involves passage through Area 1.

The new Order continues the requirements that were included in the previous Order with regard to the keeping of records by dealers and auctioneers of purchases and sales of poultry and the cleansing of receptacles used for poultry at markets. It also prohibits the consignment of poultry to railway stations. These provisions relate to the whole of Great Britain.

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The Pakistan Veterinary Medical and Animal Husbandry Association

Since the establishment of the Dominions of India and Pakistan, information as to the progress of veterinary affairs, which must always remain of more than sentimental interest to British readers, has been meagre—presumably because a stage of transition must also represent a state of flux.

So far as Pakistan is concerned, however, it is apparent from the message recently received and printed below, that something firm, well conceived and founded on the right lines has evolved already under the new dispensation, in the form of an Association of Veterinary Medical and Animal Husbandry Workers. The new Association appears to have two main objects—to mould qualified veterinary workers in East and West Pakistan into a corporate body (an Annual Register is to be created) with such aspirations as are inherent in such a conception, and to create an organisation for the purposes of meeting and publication such as will enlist the aid of workers in collateral sciences in the supreme task of raising the status of the veterinary profession in the Dominion. As will be noted, the interest of Government has been secured, and we congratulate Dr. Minett and his Pakistanian colleagues on a project, both timely and far-sighted, which we hope may, in due course, represent not only a source of strength to veterinary science and animal husbandry in the Dominion, but a valuable link in the chain of attachment with Great Britain, which still holds fast in the realm of science, despite the strain of political events.

The statement is as follows:

An Association of Veterinary Medical and Animal Husbandry workers has recently been formed in the Dominion of Pakistan with Dr. F. C. Minett, C.I.E., as its first National President; Mr. J. D. Shuja, M.R.C.V.S., was elected Honorary General Secretary and Mr. S. H. W. Rizvi, C.B.V.C., the Honorary Treasurer. The aims and objects of the Association are based on those of the N.V.M.A. They comprise the following:—

1. The promotion and advancement of veterinary and allied sciences, the affiliation of local Societies (whilst preserving their independence); and to support and protect the character, status, interest and honour of the Veterinary Profession.

2. To undertake such steps as may be necessary for the dissemination of veterinary and animal husbandry knowledge through an official organ of the Association.

3. To undertake such steps as may be necessary for the publication of an Annual Register of Veterinary Surgeons in the Dominion of Pakistan.

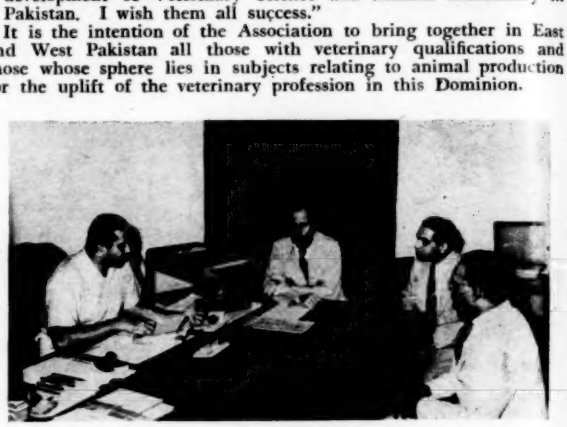
4. To hold meetings of members of the Association or of the branches from time to time in various parts of the Dominion of Pakistan, other Dominions and the Middle Eastern Countries for the discussion of veterinary topics and kindred subjects, and to publish the proceedings of the said meetings as and when and in such manner as the council shall consider necessary or advisable.

5. To do all such other lawful things as are incidental or conductive to the attainment of any of the above subjects or in any way analogous thereto; provided that the Association shall not support with its funds any object or endeavour to impose on or procure to be observed by its members or others any regulation, restriction or condition which if an object of the Association would make it a Trade Union.

The interest of the Government of Pakistan is evident from the following message sent by the Hon'ble Abdul Sattar Pirzada, Minister for Food, Agriculture and Health in the Dominion Cabinet:—

"Mr. Shuja, the Hon. General Secretary of the proposed Pakistan Veterinary Medical and Animal Husbandry Association, has explained to me the aims and objects of this Association. I welcome the idea of its formation and hope that the Association will co-ordinate all our talent in this line and devote it fully to the development of Veterinary Science and Animal Husbandry in Pakistan. I wish them all success."

It is the intention of the Association to bring together in East and West Pakistan all those with veterinary qualifications and those whose sphere lies in subjects relating to animal production for the uplift of the veterinary profession in this Dominion.



The Hon'ble Mr. Abdul Sattar Pirzada, Minister for Food, Agriculture and Health, Government of Pakistan, discusses the importance of the newly formed Pakistan Veterinary Medical and Animal Husbandry Association with the office-bearers of the Association. *L. to R.*—The Hon'ble Mr. Abdul Sattar Pirzada; Dr. F. C. Minett, D.SC., M.R.C.V.S., National President; Mr. J. D. Shuja, M.R.C.V.S., Honorary General Secretary; and Mr. S. W. H. Rizvi, C.B.V.C., Honorary Treasurer.

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ANIMAL DISEASES RESEARCH ASSOCIATION

Reporting on the work of the Association at the annual meeting recently held in its Institute at Moredun, Gilmerton, near Edinburgh, Dr. J. Russell Greig, the Director, said that the issue of products during the past year had been somewhat smaller than usual; this he believed, could be almost wholly accounted for by the serious reduction in sheep stock which resulted from the severe winter of 1946-47. The whole issue of their products, which amounted to over 350,000 doses, had apparently proved highly efficacious. Practically no complaint had been received in respect of any failure in regard to effective protection.

The louping-ill vaccine prepared for protection against that disease in sheep appeared to have proved a reliable preventive of louping-ill in cattle, but since so many cattle were now introduced on to tick-infested marginal grazings an investigation was undertaken to determine whether a vaccine prepared from cattle would produce a higher degree of immunity in these animals. The results of this work to date suggested that such a vaccine possessed no particular advantage for cattle and it was probable that the sheep vaccine would continue to be issued for both species of animals.

The work on tick-borne fever was being directed to a study of the nature of the disease with a view eventually to obtaining a means for its specific prevention. Under natural conditions it would appear that sheep, from their early lambhood, acquired tolerance to the infection but this tolerance was not an absolute immunity, and a specific means of protection was not yet in sight. In tick pyaemia of lambs they had not yet succeeded in obtaining a specific means of prevention and trials of methods of protection against tick-bite had not so far shown a significant reduction in the incidence of the disease.

As previously reported, they had now definitely determined the cause of scrapie as an infective virus and present research work on the disease was directed towards ascertaining the characters of the virus, its distribution and concentration in the different organs of the affected sheep, and its various means of transmission in Nature from diseased to healthy animals. The research had as its ultimate object the development of a preventive vaccine and possibly a blood-test by which the disease could be diagnosed in its latent form.

Evidence which they obtained some years ago appeared to indicate that there was a definite relationship between the incidence of white scour in calves and the vitamin A content of the colostrum—the lower the vitamin A, the greater the susceptibility to white scour. In collaboration with the Hannah Dairy Research Institute some very interesting, and possibly significant, data had been obtained in regard to the metabolism of vitamin A in the pregnant cow under different conditions of feeding. The significance of this work in its relationship to white scour had still to be determined.

The Bacteriological Department had been very closely engaged in the investigation of bovine mastitis. It could be said that as a result of the immense amount of work done, knowledge of the nature and conditions of occurrence of mastitis had been definitely advanced. Already penicillin had proved much the most valuable agent in the control of the disease.

In the field of research into "metabolic disturbances," the Biochemical Department was engaged on such problems as lactation tetany, acetonaemia in cows, yellowsis in sheep and swayback in lambs.

While cobalt deficiency had been shown to be responsible for a large proportion of cases of debility in sheep, there was still much to learn about the means whereby cobalt produced its beneficient effects. It was clear that the element was absolutely necessary for the maintenance of health in ruminants, and yet it need be present in the diet in only minute, even trace, amounts. Their investigations had shown that it must enter the body by the mouth; it would appear to be inert and useless, when introduced directly into the blood-stream or directly into the tissues. They therefore clearly recognised that the comprehension of its action might shed much light on the question of ruminant digestion, a subject which was, of course, fundamental to an understanding of ruminant nutrition. Meanwhile, new cobalt-deficient areas were being discovered and these were being rendered cobalt-adequate by the simple application of top-dressings containing the mineral. The saving from disease, and the promotion of health of sheep from this single procedure was quite incalculable.

Grass Sickness

"As is well-known," said Dr. Greig in conclusion, "one of the main problems which still confront us is that of grass sickness and may I first try to correct an unfortunate misapprehension. As you know, for some years past I have held the tentative opinion that the cause of the disease is an infective agent, probably a virus. There is, in fact, a close simile between the conditions of occurrence of the disease and those of certain other virus diseases including poliomyelitis, a virus disease of man. The two diseases are, of course, quite distinct in their pathology, the resemblance is confined to their conditions of occurrence. Several newspapers recently published statements to the effect that we were of opinion that the two diseases were in fact one—that grass sickness was really a manifestation of poliomyelitis in horses. We have, of course, never held such a view and it is well that this misunderstanding should be corrected.

"The tentative opinion that the disease is due to an infective agent was reached almost wholly on negative grounds. That is, I believed that, in consideration of the results of all previous work, we could eliminate the possibility of the disease falling into any category other than that of an infective process. There is, too, the fact that (as I have indicated) the behaviour of grass sickness in the field resembles that of certain other infective diseases, and the fact that in one instance an experimental pony inoculated with material derived from a case of grass sickness developed the disease.

"The Agricultural Research Council now feel that the evidence is such that transmission experiments should be prosecuted on a very extensive scale and this year we have made what is so far much our biggest effort to effect transmission to experimental horses. This has entailed a large field organisation in which we obtained acute cases of the disease in as early a stage as was possible, and no fewer than sixty ponies which were born and bred on Dartmoor (which is an area free from the disease) have been used as experimental animals. Should positive results be obtained that will provide experimental evidence that the disease is an infective process; but negative evidence will not necessarily negative that view.

"One thing is certain and that is that we cannot allow the position to remain as it is, and work must go on unremittingly until the true solution of the problem is obtained."

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LIVESTOCK PRODUCTION INCREASED

The Ministry of Agriculture's June 4th returns for England and Wales show a marked increase in livestock production. Pigs have done particularly well, and here the total has risen from 1,146,000 in 1947 to 1,631,000, and further increases can be expected now that the conditions for obtaining feeding-stuffs have been eased. Breeding sows have increased greatly—from 146,000 to 249,000.

Sheep Recovery

The total for sheep and lambs shows a certain recovery over last year, when hill flocks in particular had been depleted by the exceptional severity of the winter. The present figure for sheep and lambs, 10,848,000, compares with 10,162,000 for June, 1947, but the increase is not large enough to suggest any general return to sheep rearing.

Cattle of all descriptions have increased from 7,175,000 to 7,339,000, and this in spite of a decrease in the numbers of one- and two-year-olds. The increase in calves under a year old from 1,274,000 to 1,457,000 reflects the success of the Ministry's calf-rearing campaign, under which grants of £4 for steer calves and £3 for heifer calves of approved types are paid for every calf reared to 12 months, and prepares the way for more milk and beef in the next few years.

Milk production this winter should benefit from the 51,000 more cows and heifers which were in calf compared with last year. Cows and heifers in milk also showed a welcome increase on a year ago, the number for this year being 2,278,000, compared with 2,250,000 in 1947.

Poultry of all types increased from 41 million to nearly 52 million, with an encouraging increase in the proportion of younger birds. As with pigs, further increases are likely with the easing of rationing conditions this autumn.

Decline in Agricultural Horses

Progressive mechanisation was reflected in a decline in agricultural horses, which is most evident in the smaller number of unbroken horses. Mares and geldings for agricultural purposes numbered 384,000, compared with 403,000 in the previous year.

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BRITISH GRASSLAND SOCIETY VISIT ULSTER

In its current issue *Ulster Commentary* reports that grassland experts from all parts of the United Kingdom, as well as Canada, Australia, New Zealand, the United States, Finland, Switzerland and Egypt, visited Ulster for the summer meeting of the British Grassland Society, the party numbering nearly 200. During a three-days tour the visitors inspected pastures on numerous farms and also studied the work of the Ministry of Agriculture Research Institute at Hillsborough, Co. Down. Much valuable information concerning grassland experiments was gained.

Mr. J. C. Baird, Chief Inspector of the Ministry, informed the party that 1,750,000 acres were under grass in Ulster. Last year 630,000 acres were under crops.

Speaking at a dinner given by the Ministry of Agriculture in the Great Hall of Queen's University, the Prime Minister (Sir Basil Brooke) said: "Part of the answer to the world-wide quest for food lies in the intensive and scientific culture of the land. During the war the farmers of Ulster increased their tillage crops without reducing the number of cattle reared. Eighty per cent. of the fodder for livestock here is contributed by pasture and hay crops.

"Apart from the threat of world-wide scarcity there is the more immediate problem of raising the present level of food rationing in the United Kingdom, for without plenty of good food the workers in mines, factories and on farms cannot compete successfully in the present economic struggle. Since its foundation three years ago the British Grassland Society has been working to enrich our pastures and to make it possible in the future to feed the world's millions."

Dr. William Davies, Director of the Ministry of Agriculture Grassland Research Station at Stratford-on-Avon and President of the British Grassland Society, paid a high tribute to the way in which pastures are managed in County Down and other parts of Ulster.

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A NATIONAL HERD?

Commenting on the plea of a correspondent, quoting the success of the national stud, for a similar enterprise in cattle breeding, the Editor of the *Farmers' Weekly*, in the issue of August 20th, observes: "To a country whose native cattle stocks are of outstanding excellence, the preservation of its best blood lines, free from the vicissitudes of private commercial farming, is just as logical as, say, the national ownership of good specimens of its native art. In the field of artificial insemination, a national herd, carried on with the strictest attention to its status as a 'long-term' breeding unit, might be of incalculable good in raising standards. Cattle improvement, mainly owing to the length of gestation in the bovine and the cost of its upkeep as a large animal, is a slow and expensive business, and few private breeders, however wealthy, could afford to pursue a strictly idealistic breeding programme on any but the smallest scale over a long period. The life of even a long-lived man is insufficient to span the period required for realisation of the cattle breeder's ideals. Think what Bates' herd might have been to-day if continuity of breeding had been preserved beyond his death! Incidentally, I should very much like to hear some of our leading breeders, sinking for a moment their own partialities in the matter of variety, describe how they would plan a national herd with unlimited time to carry out a breeding programme, and freedom from the necessity of having a draft sale every year."

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents are requested to write as briefly as possible

AVOIDANCE OF TRANSMISSION OF INFECTION BY INSTRUMENTS

Sir,—There have been some accounts lately of the spread of tuberculosis by non-sterile instruments. We are assured that these instruments had been boiled for half an hour. Perhaps it is time to draw attention to the fact that these occurrences have a wider implication than at first appears. The result of faulty sterilisation is hard to assess. In most cases the infection is of a casual nature and the appearance of such an infection, after instruments have been used, gives no proof that the instruments were at fault. It is only when a specific infection, such as tuberculosis, appears in tissues known to have been free that we can fix the blame on the instrument. Since this does happen in the case of tuberculosis, it is very likely that many other infections are spread in a like manner, although this may not be obvious to the clinician.

There are two solutions to this problem. Either we discard all our instruments, as we have done the teat cannula, or we learn to sterilise them efficiently. The mere boiling of instruments for half an hour is not efficient. The organisms must be in actual contact with boiling water for this period. Instruments contaminated with mucus, pus or blood clot may be boiled for longer periods without becoming sterile, because these materials when dried or coagulated by heat, protect the organism from the water. If boiling is to be the means of sterilisation, success depends upon establishing a sound routine for cleaning the instruments *before* boiling. In this respect much will depend on a thorough washing immediately after use and before the contaminant has had time to dry. Subsequent cleaning is usually carried out at home and here soap and water and a well trained lay staff play their part.

The autoclav gives better results than boiling but here again actual contact with steam is essential and cleaning is as important as ever. The hot air steriliser, operating at 150° to 160° C. is probably the most effectual as here it is the heat alone which kills the organism. For most of us, however, the cleaning of instruments is the first step towards better results.

Yours faithfully,

A. C. Dixon.

228, High Street,
Berkhamsted.
August 25th, 1948.

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THE VETERINARY SURGEONS ACT

Sir,—Mr. John Smith, a member of the Departmental (Loveday) Committee on Veterinary Education and originally its only veterinary member, has contributed an unusually long letter upon the Veterinary Surgeons Act in your issue of August 28th. I am sure the profession will open its eyes to receive the enlightenment in it with its customary good grace and then be thankful to him for it.

Mr. Smith's letter, so far as I can see, contains but two outstanding statements: namely, one which he modestly designates as an "impression," and the other which he poses mildly as a rhetorical question.

The first, namely the "impression," is: "*. . . the great majority of the profession regard the main provisions of the Act as being necessary, etc.*" (2nd para., line 1). Would Mr. Smith tell us precisely when and where the profession, as to the great majority of its members, recorded the view that it was ardently desirous of changes taking place for its betterment in close accord with the "main provisions" of the Act as they now stand revealed? The impression of course may have been derived from hearing the witnesses summoned to give evidence before the committee on which Mr. Smith served, and, if so, the inference would be that always in the course of public enquiries of this kind the practice ought to remain of publishing the minutes of evidence. Otherwise, in what is on ample contemporary record outside those unpublished minutes, can Mr. Smith trace for us testimony in support of his impression?

The second, namely the "question," is: "*What have we gained by this Act?*" (4th para., line 1). The only answer is given by him, somewhat vaguely, I suggest, in the sentence immediately following. Will Mr. Smith tell us more definitely what he, in his own good judgment, thinks we have gained by this Act? Perhaps, to simplify reply, he will enumerate serially, in their relative order of importance, the three main gains, and give short reasons. Then again perhaps, he will be good enough to add whether in his view these substantial gains have been offset by any real losses, and, if so, likewise name three.

My motive in inviting Mr. Smith to state for us the position now reached is not to reopen controversy over issues no longer topical. It is to aid conciliation by promoting understanding of the position. We need to face that position as it presents itself before us: where there have been substantial gains our duty must be to consolidate them, and not merely stand still and exult over them; where there have been real losses the wise course must be to cut them, and not waste time in growling over them. That there should be both gains and losses is natural in advance as well as defeat. And even in defeat, as we well know in this country, ultimate victory will come to the cause which is not dismayed at contemplation of its temporary losses, however severe they be, but holds on to its gains and is then in good heart ready to exploit them.

Mr. Smith, having been selected on his merits originally by authority to assess and interpret the veterinary cause, has now come out very properly as an advocate of conciliation. Every fair-minded man and woman will honour him for it and wish him well in the effort.

Yours faithfully,

J. T. Edwards.

University of London Club,
21, Gower Street, London, W.C.1.
August 30th, 1948.

. . . . .

Sir,—As a member of Council I should like to endorse the plea contained in Mr. John Smith's letter. If his letter is studied carefully it will be understood why many members of Council felt the greatest sympathy for Mr. H. W. Dawes at the apparent ingratitude of his critics. We had all seen the very real anxiety which the President felt in the situation so well described by Mr. John Smith and we had admired the dogged persistence with which he fought for those amendments which he knew the profession would like.

Your faithfully,

L. P. Pugh.

Stidulfe Meade,
Seal,
Sevenoaks.
August 29th, 1948.

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Advertisers' Announcements

Improved Louping-Ill Vaccine

Burroughs Wellcome and Co., announce that they are now issuing "Wellcome" brand Improved Louping-Ill Vaccine for autumn use in sheep and cattle. This recently developed vaccine contains few tissue particles, is easy to inject and gives good protection in sheep in doses of 2 c.c. (cattle, 10 c.c.). Issued in bottles of 50 c.c.—16s. 6d. (subject to professional discount).

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
August 1st, to 15th 1948	7	—	15	—	2	—
Corresponding period in—						
1947	8	—	42	—	—	2
1946	4	1	—	2	—	9
1945	6	2	—	—	1	37
Jan. 1st to August 15, '48	62	—	230	1	31	21
Corresponding period in—						
1947	63	103	696	1	35	19
1946	64	31	—	7	39	297
1945	71	101	—	6	48	616

Note.—The figures for the current year are approximate only.

*** Excluding outbreaks in Army Horses.**